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Reclaiming High-Speed Steel Scrap

Conversion of a Commonly Wasted Product
Into a Valuable One by the Onondaga
Steel Co.—Rolling Mill of Unusual Design

BY EDWIN F. CONE

UNTIL the establishment of the Onondaga Steel Co., at Syracuse, N. Y., or up to three years ago, about 40 per cent of all the expensive high-speed steel sold and used was thrown away. This consisted of the short or left-over ends of tools, cutters or other broken pieces as well as certain scrap left after cutting up the various bars from which the separate tools were made. There have been attempts, more or less successful, to weld such tool ends to new tool shanks and thus make use of them, but the applica-

tion of this suggestion provided for consuming only a portion of such scrap.

A method of converting high-speed steel scrap by the wholesale into a merchantable product was suggested by S. S. Buckley, now the president of the Onondaga Steel Co., a man of wide experience in the manufacture and sale of high-speed tool steel. Mr. Buckley believed it possible to collect this scrap, sort it and to convert it into a first-class standard product.



The High Speed Steel Scrap As It Is Received and the Skilled Sorters at Work. From the nature of the sparks from a special grinding wheel these men detect and sort the steel



The Scrap, Mixed with Other Materials, Is Melted by the Crucible Process. Pouring a pot of metal from the direct fired gas furnace

Others, to whom he outlined his ideas, said it could not be done on a commercial scale.

By no means discouraged, Mr. Buckley talked over this project with a friend, Edgar D. Newkirk, a man of unusual resources as a metallurgist and engineer. The final result was that the plan was tried on a small or experimental scale first. A quantity of regular scrap high-speed steel was obtained in the open market, the high tungsten portion was separated from the rest by a method perfected by the originators and described later.

The simplest means possible to melt the scrap was desirable. Mr. Newkirk believed it could be done in a direct gas-fired single pot crucible furnace. Others insisted this was impossible. After many trials and setbacks a furnace was perfected in which not only one crucible could successfully be melted by direct firing, using city gas, but it was found possible to operate a two-pot furnace by this method. A 100-lb. hammer was secured and installed in the original building, rented for the experiments, and a commercial product of standard composition was made on a small scale from miscellaneous scrap.

From this interesting and up-hill beginning the business has grown, until now thousands of pounds of a standard high-speed steel are made each day in the company's new plant and rolling mill in the northern part of Syracuse. After the 100-lb. hammer came a 500-lb. one and then a 1200 lb. steam hammer, together with more melting furnaces. Later came the new plant with its own melting department, a unique rolling mill and all the heat-treating, annealing and other equipment that go to make up a modern plant of this character.

Two distinctive features characterize the Onondaga process for converting scrap high-speed steel into a standard product. These are the sorting and conversion of the scrap; the flexible rolling mill unit of unique design, especially adapted to the peculiar needs of the business.

The proposition of the Onondaga Steel Co. is that any company, no matter what its nature, having a collection of high-speed steel scrap may send it to Syracuse. In return for the actual high-speed scrap received the company will convert it into an equivalent weight of its standard high-speed product, the only charge being one for conversion.

As indicative of the success of this proposition

it may be stated that over 900 different companies located all over the United States and including two of the largest railroads and most of the leading automobile companies are sending their scrap to Syracuse, and that since the incorporation of the company in July, 1916, over 900,000 lb. of such scrap has been reclaimed or converted. Japan has sent such material for conversion.

One reason for the hitherto relatively small value of high-speed steel scrap has been its varying and uncertain quality and the difficulty in separating different kinds. Each maker has been willing to accept in return only his own brand. Realizing these facts, it became necessary for the promoters of the company to devise a method of separating not only high-speed steel from carbon steel, but also the various grades of high-speed steel. The sorting is one of the most important steps in the process. The scrap, as received in lots of 25 to 100 lb. or more, consists of a collection of broken cutters, reamers, drills, tools and end trimmings from the forge shop, all of different brands.

The sorters take each piece and determine its composition by the character of the sparks it makes by contact with a rapidly revolving wheel of special composition. Comparing the color, size and shape of these sparks with a known standard, these men have become, by long and careful training, so expert as to classify the scrap successfully. One of the illustrations shows the sorters at work and some of the scrap as it is received.

After sorting, a mixture is made of the different grades, and the required new elements, such as tungsten, chromium and vanadium, muck bar, etc., are added to bring the resulting product, when melted and treated, up to the company's standard. The melted steel is poured into ingots about 4 in. square and 2 ft. long. These are annealed and their surface imperfections removed. The next step is to cog or break down the reheated ingots under heavy hammers to billets about 2 in. square and 5 or 6 ft. long. These are again inspected and defects removed. The last operation is the rolling of the steel into the various rounds, squares and flats specified by the consumer, the only specification permitted. After the finished products have been packed in sealed tubes, and annealed in furnaces of the company's own design, they are inspected and shipped.

Previous to the time that the growth of the

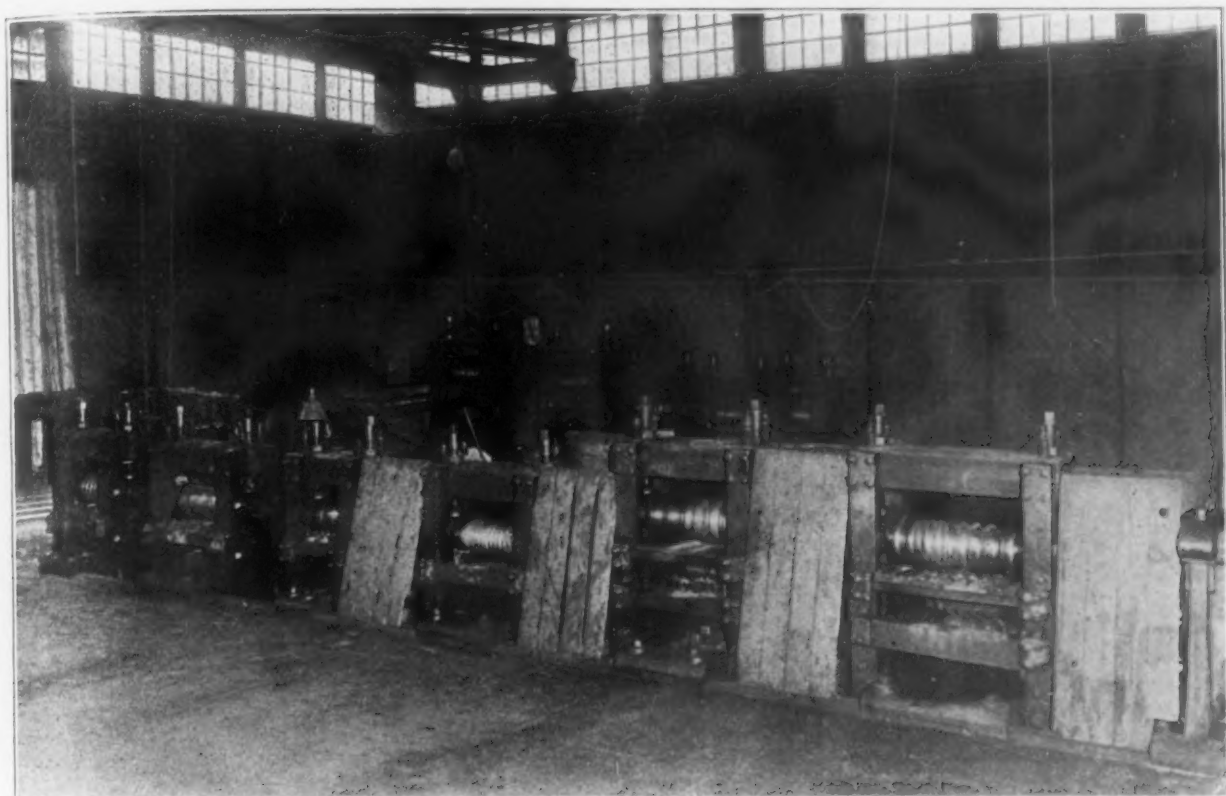


Part of the Swing Grinder Equipment for Removing the Defects in the Ingots or the Bars

business warranted the building of a new plant, all the material was finished under hammers. It was realized at once that to roll a variety of sizes and shapes, mostly on small orders and specifications, involved a difficult problem in the design of a rolling mill. To meet such conditions the mill must be different from any of the larger capacity units.

squares, etc., in one-half to three-fourths of an hour, which may be a complete change of the train, where in the ordinary construction in which the rolls are changed the time consumed would be from 2 to 5 hr.

Another advantage in this type of mill is that the rolls, set permanently in the stands, are left



The Only Rolling Mill of Its Kind Now Operating. It is a 10 in. mill in which each stand is a separate unit. Those in the background can be substituted for any of those in the train without changing the rolls, but enabling the production of any size of round, square or flat bars in a minimum of time.

Some of the problems and conditions involved were the following:

Because of the intention to roll nothing but high-speed steel on such a mill, it was felt that it must be especially rigid.

Because of the comparatively limited tonnage to be rolled on this mill and because of what would generally be called the small cycle of its operations, it being necessary from the nature of the business to produce sizes in very small quantities in comparison with soft steel mills, it would have to be constructed so that very quick changes could be made.

The organizers state that when these problems were submitted to rolling mill experts, the answer came back that the steel industry had not hitherto demanded such a mill and that the development and the designing of such a mill would make its cost prohibitive.

As in the sorting problem so in this the organizers of this project succeeded in overcoming these objections and difficulties, and the result has been a rolling mill claimed to be entirely different from any other and thoroughly successful and efficient. Their contention was that the desired end could be accomplished by building each stand as an integral machine so that different sizes or shapes would result by a change of complete stands in the train rather than changing the rolls in the stands. In other words, each stand in this new mill, which is a 10-in. mill, is a machine unit, so to speak.

By this method of construction, the company, after over a year's operation, finds that it is able to change from flats to rounds, or rounds to

practically in adjustment. Therefore in a change from one size or shape to another, the trial bars are run through in high-speed steel and come through practically to size, while in the old way of changing the rolls and making adjustments back to size each time the great value of high speed steel would have made its use prohibitive for test bars, and there would be the inconvenience resulting from the danger of having such soft steel bars, as might be used for this purpose, mixed up with the regular product. It is claimed that there would also have been encountered the need, even after preliminary tests of soft steel, to make finished tests with high-speed bars due to the fact that the high-speed, because of its density, would not have given the same reductions even at the same set-up as the soft steel stock.

The developers of this proposition, the success of which has been largely due to Mr. Newkirk, thus have a mill so arranged that it serves as the equivalent in filling orders to a fair size stock of high-speed steel, so that while the equipment investment is much higher than in a standard mill, the saving in stock investment more than compensates for this.

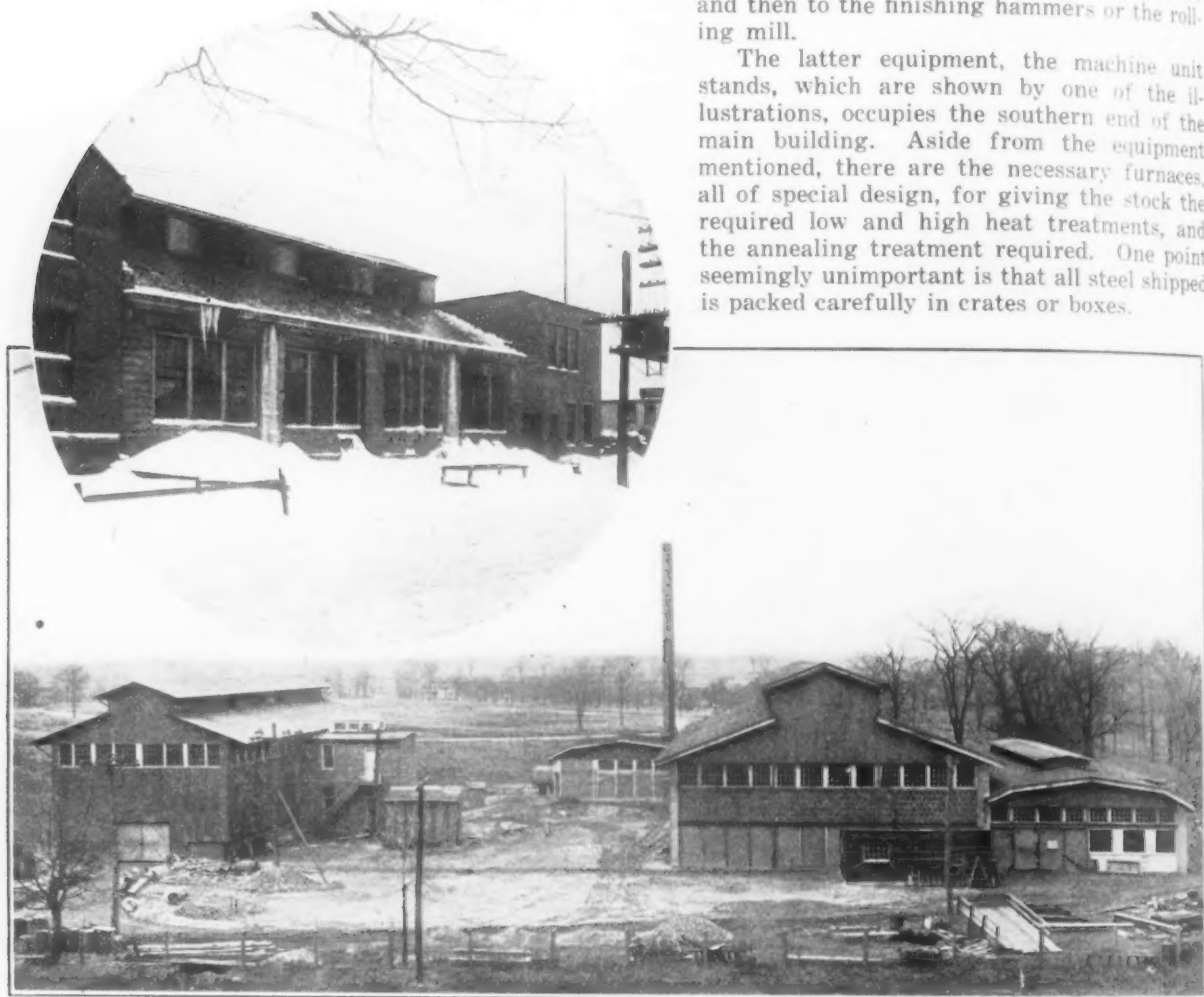
The new plant consists of a main mill building, 100 x 140 ft., and a separate melting building, 40 x 100 ft., and there is at present time under construction a warehouse and office building, 40 x 100 ft.

From the melting or crucible building the ingots go to the annealing furnaces in the main building for heat treatment and from there to the grinding department, where surface imperfections are

removed. They then pass on to the hammer department occupying the northern end of the building, where they are again heat treated, and then raised to the proper forging heat and coggled into

billets about 2 in. square and 5 to 6 ft. long. After this operation the billets are returned to the inspection and grinding department, where imperfections are eliminated by grinding or other methods, and then to the finishing hammers or the rolling mill.

The latter equipment, the machine unit stands, which are shown by one of the illustrations, occupies the southern end of the main building. Aside from the equipment mentioned, there are the necessary furnaces, all of special design, for giving the stock the required low and high heat treatments, and the annealing treatment required. One point seemingly unimportant is that all steel shipped is packed carefully in crates or boxes.



The Original Small Building, in Which the Onondaga Process Was First Developed Into a Commercial Scale, and the New Plant of the Onondaga Steel Co. These reveal the extent of the expansion of this project in less than three years.

Government Will Sell French Rails

The War Department announces that it will sell at market prices the surplus stock of 80-lb. rails and 25-lb. rails ordered for the American Expeditionary Forces over seas but not required in view of the signing of the armistice. The 80-lb. rails on hand amount to about 50,000 tons and there are roundly 7000 tons of 25-lb. rails, also large quantities of crossings, slip switches and turnouts. The greater part of the material is at Atlantic port readily accessible for loading. The sales are being conducted through the office of the Director General of Military Railways, Washington.

Stimulation of Coke Business Expected

UNIONTOWN, PA., March 24—Early stimulation of the coke business in the Fayette county field with a full time basis of operation is seen following the announcement from Washington that iron and steel representatives and the industrial board of the Department of Commerce had reached an agreement on the prices for basic iron and steel commodities. The price of pig iron placed at \$25.75, a drop from \$33 since last December, is expected to bring the price of coke to around \$4.70 a ton, ovens, if the war-time ratio of 5.5 to 1 as between pig iron and steel is maintained. There is every indication that the proportion is to be continued, say operators here, and especially in view of the fact that Judge Gary has announced that the wage scales are not to be interfered with. It is held that the ratio is just, inasmuch as it was fixed for war time conditions following agreements with the War Industries Board

and the steel men and approved by the Fuel Administration. During the period of readjustment there have been a few sales as low as \$4.25, but the usual price has been around \$4.50 and \$4.75, with a few sales at \$5.

Foundry coke producers in the county, of whom there are only a small number, however, report their market to be firm, with but little change in price levels.

During the week 500 additional ovens widely scattered in the region were put out, but as a whole the coal and coke situation throughout the territory continued to mark time with scarcely any change in the situation over that of the preceding week.

A cylinder boring attachment for lathes has been placed on the market by the South Bend Lathe Works, 425 East Madison Street, South Bend, Ind. The compound rest is removed from the saddle and a jig bolted firmly to the carriage. The engine cylinder is clamped to the jig after being centered by means of a bushing and plug. The device is made in different sizes.

An abrasive block for resurfacing collector rings that are rough and worn is manufactured by the Ideal Commutator Surface Co., 4 South Dearborn Street, Chicago. The abrasive block is mounted on a suitable handle so that it can be held against the revolving collector ring or armature.

The Pittsburgh Crane & Equipment Co., Sharpsburg, Pa., has patented and put on the market an auxiliary hoist attachment for standard single hook crane trolleys.

DIFFICULT STEEL CASTING

Progress in Making Sound Steel Does Away with an Expensive Forging

In a discussion on the subject of the occlusion of gas by metals at a recent meeting of the Faraday Society (British), Sir Robert Hadfield presented an interesting account of the details involved in making certain difficult steel castings. It is now possible, he said, to produce steel castings of all kinds and weights of perfectly sound material, provided the section is not too thin. He described a particular instance, the production in England of hydraulic cylinders for cotton baling presses, by a company with which he was connected. This foundry had been unusually successful in making these difficult castings because of the careful study made in the art of producing sound steel. An abstract of his description follows:

These cylinders, cast of steel and not forged or pressed in any way, are of a particularly difficult nature, in some cases running up to lengths of over 30 ft. Such considerable length is for the purpose of obtaining a very long stroke in pressing at the same time as many cotton bales as possible. The complete presses are made in this country and sent out to India, Egypt and elsewhere. The ram is usually comparatively small, 7, 8 or 9 in. diameter; the walls of the cylinders must be as thin as possible in order to save weight, and yet must stand the severe hydraulic test pressure of about 4 tons per sq. in., and they must be guaranteed to work constantly day and night during the baling season at pressures up to 3 tons per sq. in.

There must not be the slightest weeping or oozing through the walls, for if the pressure is not fully maintained the baling will be a failure, the bales not packed sufficiently tight, and therefore occupy far too large a room in shipment from the cotton growing district to the cotton mills in Lancashire and elsewhere. To bring home the severity of this hydraulic test it may be stated that the total internal area of the working surface subject to the high pressure mentioned, amounts to about 10,400 sq. in., in not one square inch of which must there be the slightest unsoundness or porosity. The testing pressure is about 100 times the pressure at the nozzles of the hose pipes used by the London fire brigade when throwing a stream of water 1½ in. diameter to a vertical height of 165 ft.—that is, 20 ft. above the Nelson Monument in Trafalgar Square.

In the early eighties these cylinders were made of forged and fluid compressed steel produced by the Whitworth process, for which a very high price was paid. However, by the careful study of the cause and action

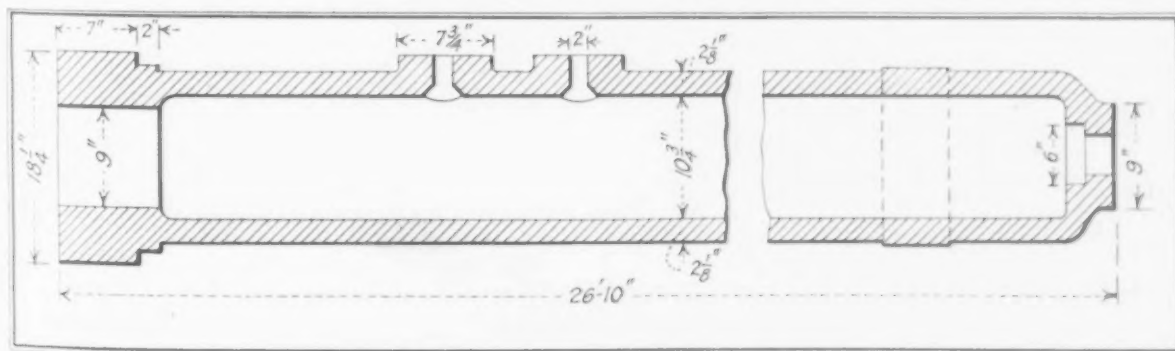
severe contraction met with in the cooling down of molten steel from about 1540 deg. C. This contraction or shrinkage is slightly over ¼ in. per ft., thus adding to the practical difficulties experienced, the mold for such cylinders being required to be about 7 in. longer than the cylinder itself is when cooled down.

The example is a typical one and helps to explain how important has been the advantage of studying by means of scientific methods the question of getting rid of occluded gases. It should be remembered that fluid steel is at a very high temperature, and in the first part of the pouring into the mold there is a drop of about 30 ft. down the narrow space to form the walls of these cylinders for cotton presses, which in some cases are only about 1½ in. thick, and very seldom more than 2¼ in. Bearing in mind, too, that the fluid steel, when being poured, is at the temperature of some 1540 deg. C. and that gases are given off from the sides of the mold which is formed of fire-resisting material such as silica sand, composition and other mixtures, it will be readily seen—specially with regard to the early poured steel dropping that long distance—how great must be the tendency of the molten steel to absorb gases and to become unsound. It must be remembered also that molten steel, which is quite fluid at from about, say, 1500 to 1540 deg. C., immediately below these temperatures, has more the consistency of thick cream, and not many degrees lower it is quite pasty. The great difficulties, therefore, of working within these narrow margins of fluidity and semi-solidity will be readily understood. It will, therefore, be admitted that the study of methods which get rid of occluded gases is of the highest service to the constructive engineer, and that our gratitude is due to those French metallurgists who, in the early days of the development of ferrous metallurgy, attacked this severe and complex problem of giving us ferroalloys by the aid of which we could obtain the necessary sound steel free from blow holes, occluded gases and other defects.

Pittsburgh Steel Co.'s Complaint

HARRISBURG, PA., March 25.—The complaint of the Pittsburgh Steel Co. against the rates for an intra-State haul of the Monongahela Railroad and the Pittsburgh and Lake Erie Railroad, heard recently by the Pennsylvania Public Service Commission, is the first formal complaint against intra-State railroad rates to reach the completed stage as far as evidence is concerned in which the United States Railroad Administration has declined to appear or to have any of the railroads involved, participate. The ruling of the commission is expected within several days.

The authority of the Public Service Commission to



Cross Section of 26-Ft. 10-In. Cast Steel Cylinder for Cotton Press

of occluded gases, their prevention, the best steel for the purpose and the best methods of molding the cylinders and the pouring of the steel, Messrs. Hadfields, of Sheffield, many years ago gradually overcame the difficulties and became able to meet the severe requirements by making a hydraulic cylinder costing about half the price of one made by the Whitworth process. Thousands of such cylinders as the one shown in the illustration are in use all over the world, giving entire satisfaction.

The problem of satisfactorily producing such a casting is greatly increased and intensified by the

hear the case had been challenged, but it was held that the State had authority over intra-State rates, notwithstanding the Federal control. It was asserted that the war emergency in transportation had passed, and the respondents had been ordered to appear and go on with their side of the case, but failed to appear.

The Carnegie Steel Co., Pittsburgh, has announced its intention of selling its cotton ties direct this year, instead of through jobbers, which has been its custom for many years.

AMERICAN TOOLS IN AUSTRALIA

Factors Which Will Determine the Permanence of the United States Present Leadership

Australia is rapidly becoming a manufacturing country, according to the Far Eastern Division of the U. S. Bureau of Foreign and Domestic Commerce, and the demand for certain American machinery and machine tools is increasing. As a majority of the engineering establishments are also jobbing shops, the engineers in charge are averse to buying from catalogs, but desire actual demonstrations, especially of new machines, and the majority of sales are accordingly made after a sample machine has been received by the agent or importer. A substantial additional discount on introductory orders should be allowed, particularly in highly specialized lines, as otherwise there is not sufficient incentive to warrant the importer taking the risk of the machine not being a success. Types of American machines, which have subsequently enjoyed exceptional sales, have been kept off the Australian market for years because the manufacturers did not put a sample machine into the hands of a good agent and were finally introduced by the importer who took a chance on their success.

The majority of the manufacturing plants and the largest engineering shops are situated in Sydney and Melbourne. The former took 53 per cent of the imports of machine tools in 1916-17, and the latter 37 per cent. The territory of Queensland, however, with its rapidly expanding meat trade and meat-canning industries will show an increased demand for machinery and machine tools in the next few years, although taking only 4 per cent of the total imports of machine tools in 1916-17. The same is true of Western Australia, with its gold-mining developments. Wool and textile manufacturer are the leading industries in Victoria and New South Wales, and their growth has been hastened by lack of shipping facilities which has cut off Australia from foreign markets.

Exclusive Agency Most Acceptable

The exclusive agency is accepted as the most satisfactory method of selling machinery and accessories in Australia. Some of the established agencies have a certain circle of customers, but progressive agencies make themselves of general service to all customers. Moreover, in a country like Australia, where vast distances must be traveled seeking orders and modern machinery is just being introduced, it is only fair to the agent who has stocked a machine, which may sometimes prove unsalable, that he be protected by an exclusive contract. If proper care is taken in the selection of a progressive house there is little fear that such an arrangement will be used to stifle competition, such firms generally being as anxious to develop business as the manufacturer.

Method of Financing Orders

Since the war Australian importers have arranged for cash payments against documents in New York, and there is little probability of an early return to the old method of sight drafts with documents.

The price list in almost universal use in Australia is made on a small loose sheet punched with 3¼-in. holes at 3-in. centers. The advantage of conforming to such styles of price lists and insuring the maintenance of complete files of prices is apparent. This same suggestion holds good with reference to delivery information sheets and sheets showing machines in stock.

The Australian import agent seems to have legitimate fault to find with the American manufacturer's optimism in making delivery promises. It is, of course, open to question whether under the abnormal war conditions any industry can function with the same precision as in peace times, and now that peace is at hand American manufacturers will be quick to convince Australian importers that they are as ready and willing to make as satisfactory deliveries as other countries. All the Australian agent seems to request is that orders

be delivered in the same rotation as received, any other treatment is not only unfair but a source of embarrassment and expense to the importer who has given his customer a specified date of delivery. Perhaps the importers would not complain if they were quoted definite dates of delivery even three times as long as those given, as they would then know what to expect and could explain to their customers, but a short-sighted policy of accepting all orders at delivery dates impossible of execution is to be avoided.

Information and Instructions Wanted

Foundation plans, instructions for setting up, and information regarding the working of machines are all greatly desired. Such information is usually the sole guide of employees who work the machines, and in many cases newly introduced types of machines can be satisfactorily set up in no other way than by following printed instructions.

Australians Close Readers of Our Trade Press

The Australian importer is a close reader of the leading American machinery trade journals, and information regarding new types of machines is often requested on the strength of these advertisements. Naturally the importer who writes for a particular machine is interested in other types and a sale of some other machine might be effected at once if other catalogs were sent, whereas the order for a similar machine is placed with a competitor of the manufacturer because of this lack of business foresight. This situation is better appreciated when it is realized that under present conditions it requires 10 weeks for a letter to reach Australia and a reply be received. For this reason it is sometimes advisable in case of unstable price conditions to state that prices will hold until a definite date so that the Australian merchant will be able to cable his order in case the letter is delayed.

Practically all machinery is subject to customs tariff in Australia and must undergo inspection, and for this reason it is preferable to leave one board on the top of the case not hoop ironed and nailed, but simply screwed down. This board should be located so as to allow a good view of the machine. The loading and warehousing facilities in Australia are not the best, and few cranes are employed, so that strong packing is desirable.

Strongly Built Lathes in Demand

Lathes are the most important essential in the machine shops which are springing up in Australia. As the majority of the work of these shops is jobbing, the machine tools should be universal. Gap lathes, for instance, permit one machine to cover a large range of work and are very popular in Australia. One American machine of this universal type has enjoyed a very large sale. Most of the American gap lathes before the introduction of this one were cheap, and light tools are not in demand. Another popular lathe of English manufacture has very large bearings and a rugged headstock which appeals strongly to the Aus-

Machine-Tool Imports into Australia

Imported from	1914-15	1916-17
United Kingdom	\$265,039	\$424,846
United States	226,307	407,618
Germany	9,081	
Sweden	6,964	1,883
Belgium	4,993	
New Zealand	1,153	5,767
Canada	3,236	4,803
All other countries	346	8,370
Total	\$517,119	\$853,267

tralian market and is in more universal favor in large mining shops than any other tool.

The price of American planers as compared with that of English makes is disproportionately high. Though the American planers are very high-grade, with a number of automatic and convenient feeds, these conveniences have made the price too high for the Australian market, and at present there are not half a dozen of these machines in use in that country. A moderate-priced simple planer could be introduced to

advantage. This is equally true of punches, shears, rolls and other tools used in shipbuilding and structural work, our price of which is out of all proportion to the prices of British makes.

American Imports Increased

The foregoing table shows the increase by countries in imports of machine tools since the beginning of the war.

In the past five years the imports of machinery comprising cream separators, harvesters, mowers, reapers, binders, dynamos up to 200 hp., electric starting apparatus, and weighing machines, were 47 per cent from the United States, 25 per cent from the United Kingdom, 16 per cent from Canada, 10 per cent from Sweden, and 2 per cent from other countries.

The decrease in imports of gas, oil and other engines, locomotives, agricultural implements, motive-power machinery, printing presses, sewing machines and all other machinery from \$22,157,082 in 1912 to \$22,841,066 in 1913, \$19,016,468 in 1914, \$15,415,517 in 1915-16 and \$15,317,304 in 1916-17 is attributed mainly to war conditions involving scarcity of tonnage and an abnormal demand on the machinery manufacturers at home, although the fact that the number of establishments in Australia using machinery increased from 9264 in 1910 to 11,438 in 1915, with an increased horsepower requirement from 298,601 to 504,834 would point to a healthy industrial growth which has been fostered by war conditions. The country of origin of these imports in 1916-17 was United Kingdom, \$4,374,837; Canada, \$526,727; United States, \$5,569,363; Sweden, \$168,240, and all others, \$160,710; or the United Kingdom, 36 per cent of all machinery; Canada, 8 per cent; United States, 50 per cent; Sweden, 4 per cent, and all others, 2 per cent.

Promising Outlook for American Trade

The United States is, therefore, the leader in the machinery market of Australia, according to latest available statistics. Whether this leadership is maintained will of course depend upon a great many considerations, not the least important of which are closely related to the suggestions here made. The Australian machinery merchant is fully alive to the advantages and good points of American machinery, just as he appreciates most keenly the weakness in our export methods, the brunt of which eventually must be borne by him. The closest attention should be paid to his wishes if we are to encounter a full measure of success.

New Steel Works in France

F. E. Norris, for some years at the Farrell and Sharon, Pa., works of the Carnegie Steel Co., who was appointed several years ago general manager of the new open hearth steel plant to be erected by Automobiles M. Berliet at Venissieux (Rhône), France, has placed some contracts for the equipment of this new plant, the output of which will be used entirely in the manufacture of steel for automobiles. To the Treadwell Engineering Co., Easton, Pa., was given a contract for a 34-in. blooming mill. The main open hearth building will be 150 x 176-ft. in size, and will be built by the Blaw-Knox Co., Pittsburgh. The initial plant will contain two 50-ton open hearth furnaces, but is laid out for twelve. There will also be two 4-hole soaking pit furnaces, and the bindings for the open hearth and soaking pit furnaces will also be built by the Blaw-Knox Co., all masonry work to be done by the company itself in France. The cranes for the open hearth and soaking pit furnaces include a 15-ton charging crane and a 75-ton ladle crane, which have been built and already shipped by the Morgan Engineering Co., Alliance, Ohio. The small stripper and pit cranes will also be furnished by the Morgan Co. The Treadwell Construction Co. will furnish the ladles. A 2000-hp. flywheel motor generator set for driving the blooming mill will be furnished by the Westinghouse Electric & Mfg. Co., and this company also has a contract for the auxiliary motors for the blooming mill. Practically all the machinery will be electrically driven. The only steam generated in the plant

will come from waste heat boilers in connection with the open-hearth furnaces, this steam to be utilized in the operation of the gas producers, pumps, air compressors and other machinery. It is intended later on to add to the plant a 24-in. bar mill and sheet and jobbing mills and there will also likely be added a small merchant mill for the rolling of rounds, flats, squares and other shapes. All buildings will be equipped with steel sash furnished by David Lupton Sons Co., Philadelphia.

British Steel Exports in January

Exports of iron and steel from Great Britain in January, 1919, are officially reported as 170,543 gross tons, excluding iron ore and including scrap. This compares with 139,151 tons in January, 1918, and with 210,124 tons in January, 1917. The average per month in 1915, 1916 and 1917 was 220,670 tons, 279,695 tons and 195,466 tons respectively. The pig-iron exports were 30,574 tons against 40,503 tons in January, 1918. The outgo of steel bars was 17,615 tons or about 7000 tons less than in January, 1918, while that of rails was 2858 tons as against 2272 tons in January, 1918.

There has been an increase in exports of tin plate and steel plates. The January tin-plate exports this year were 19,135 tons as compared with 16,234 tons in January, 1918. The exports of steel plates not under $\frac{1}{8}$ in. thick was 28,155 tons last January against 5451 tons in January, 1918.

Ferromanganese exports were about 4300 tons last January or 6000 tons less than in January, 1918.

Imports of iron and steel in January, excluding iron ore and including scrap, were 52,569 tons as compared with 29,517 tons in January, 1918. The monthly average in 1915, 1916 and 1917 was 107,550 tons, 64,404 tons and 41,401 tons respectively. Iron-ore imports last January were 544,414 tons, of which 414,809 tons came from Spain. These imports in January, 1918, were 454,243 tons of which 339,768 tons were credited to Spain. Pig-iron imports last January were 27,070 tons as against 12,132 tons in January, 1918. Ferroalloy imports, largely ferrosilicon, were 1234 tons last January as compared with 1645 tons in January, 1918.

Manganese ore imports were 33,216 tons in January this year as compared with 77,277 tons in January, 1918.

Canadian Pig-Iron and Steel Output in 1918

The Canadian pig-iron output in 1918, according to a preliminary report by the Canadian department of mines, was 1,194,000 net tons (1,066,071 gross tons) as compared with 1,170,480 tons (1,045,071 gross tons) in 1917. Of the 1,194,000 tons made last year, 30,425 tons was made in electric furnaces from scrap steel and sold as low phosphorus iron. The rest of the output was 966,409 tons of basic iron, 15,415 tons of Bessemer and 181,696 tons of foundry and malleable iron. Pig-iron exports in 1918 were 2130 tons.

The 1918 output of ferroalloys, mostly high grade ferrosilicon was 44,700 tons as compared with 43,465 tons in 1917.

The production of steel ingots and direct steel castings in 1918 was 1,893,000 net tons (1,690,178 gross tons), of which 1,820,000 tons were ingots and 73,000 tons were castings. These figures compare with 1,691,291 tons of ingots and 54,443 tons of castings in 1917.

The output of electric steel is estimated at about 120,000 tons in 1918 as compared with 50,467 tons in 1917, with 19,639 tons in 1916, with 5625 tons in 1915 and with 61 tons in 1914.

The iron-ore output in Canada in 1918 is put at about 206,820 net tons, comparing with 215,302 tons in 1917. Of the 1918 production, 197,637 tons came from Ontario mines and 8153 tons from Quebec.

The Boston News Bureau has just completed a telegraphic canvass covering every State in the country, and ascertains that on Jan. 1 a total of 6,225,192 automobiles and motor trucks were registered, an expansion of 73 per cent in two years. The average cost to the purchaser of the cars and trucks now on the road was \$1,000, so that there was a total investment of \$6,225,192,000.

RECENT CRANKSHAFT REPAIRS

Six-Throw Crankshaft Made from Steel Billets by Thermit Process

Although the thermit welding process is fundamentally adapted to the welding of large steel sections of almost every description, because of the perfect amalgamation of metal produced by the extremely high reaction temperature, probably the most prolific source of heavy steel repairs is the breaking of crankshafts. These vary widely in type, use, size and location of break. Another use for the process is in the altering of shafts to fit machinery of a different size from that originally used. Several recent instances of such repairs and alterations are described in the following article.

Shafts almost always break because of some flaw or defect in the material. This is often an old forging in the case of built up shafts which gradually spreads

until finally the shaft gives away. Such a shaft after welding is really a better shaft than originally, because the flaw has been located and eliminated and the rest of the shaft has been thoroughly tested.

A successful crankshaft alteration, Fig. 1, was recently accomplished in a large Pennsylvania plant. In this case the process consisted in welding a steel section 10 in. long and 27 in. in diameter to one end of a single throw crankshaft, 25 in. in diameter. The shaft cost \$45,000 and was taken from a 1000-hp. engine. The additional work required afterward to complete the operation consisted in machining down the new extension and making a seat for a coupling. In placing the extension section in position for the weld, a gap of 3 in. was left between the extension and the shaft; 150 lb. of wax were used in the space to be occupied by the welding metal; 2800 lb. of railroad thermit with 5 per cent extra punchings were supplied for the welding reaction. The riser formed from the pouring of the metal had a diameter varying from 12 to 14 in. and was 18 in. high. This shaft has been back in operation for some time, and is giving good service.

One recent example of crankshaft repair work is remarkable for the short time required for the work, considering the large size of the section. The weld was made on an extension to a 20-in. blooming mill crankshaft, Fig. 2, used by one of the larger foundries in the Pittsburgh district. The welding of this shaft was started on a Monday morning at 7.30. The men worked continuously until 1 a. m. on Wednesday, when the weld was poured. As a result of this prompt repair service the mill was out of operation only 10 days. The ex-

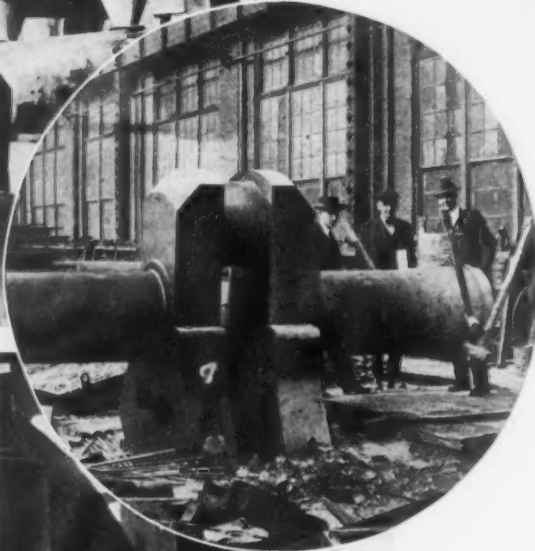
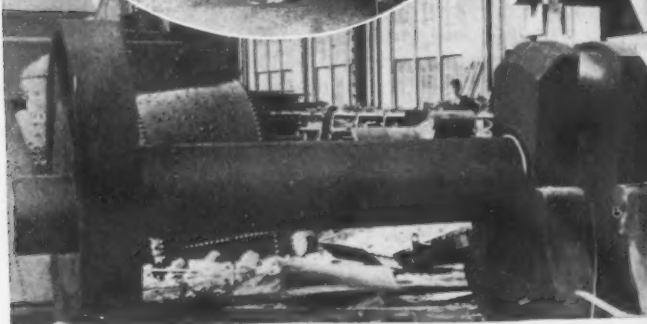
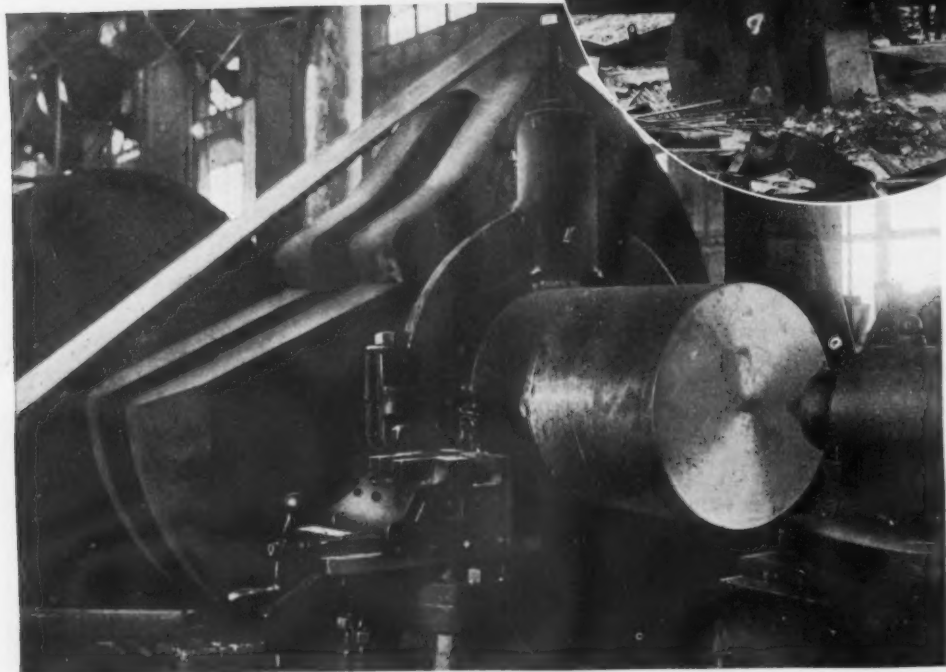


Fig. 1—A Steel Section 10 In. Long Welded to a 25-In. Single - Throw Crankshaft. The views show the extension section placed in alignment with a 3-in. gap; the four crucibles in position for pouring; the finished weld; the section machines



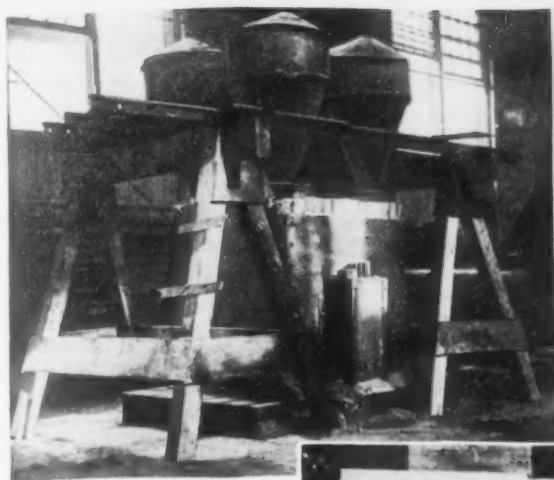
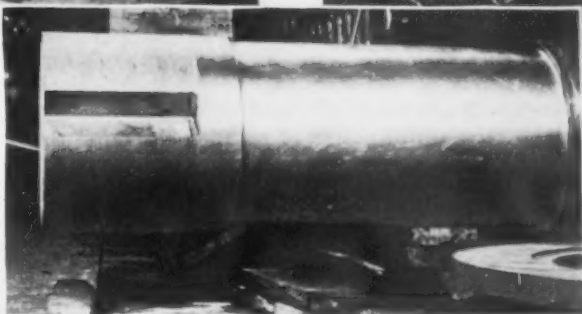
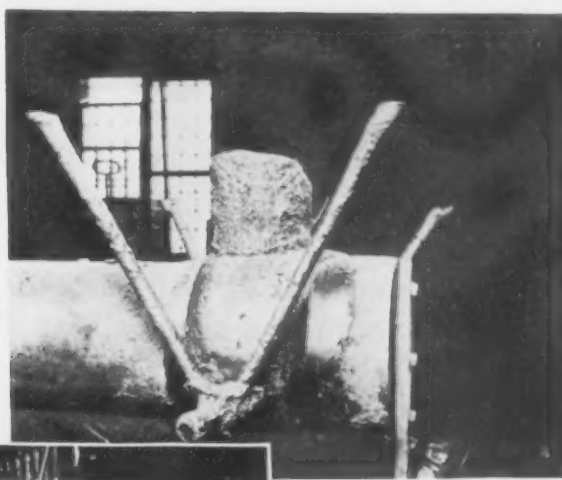


Fig. 2—An Extension 17 In. Long. Welded to a 20-In. Blooming Mill Crankshaft. The views show the crucible in place



over the mold box the finished weld before the gates and riser were removed; the weld after machining

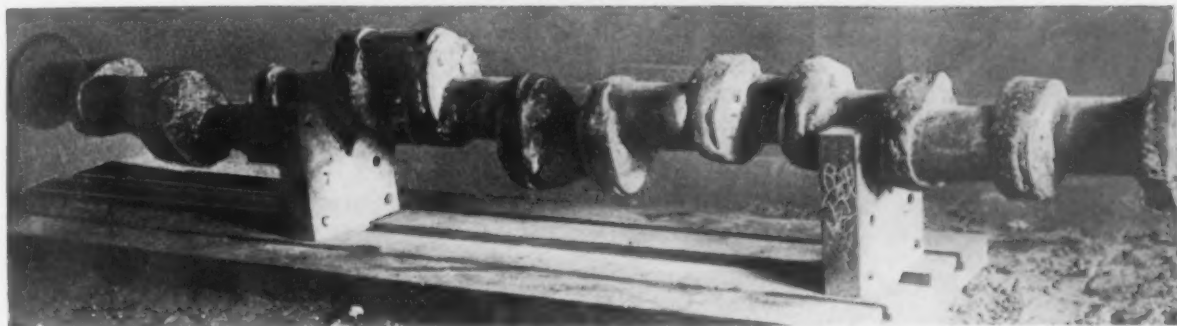


Fig. 3—Six-Throw Crankshaft Made by Welding Pins and Main Journals Together, the Weld Forming the Slabs

tension section was 17 in. long and 22 in. in diameter, the difference in size between this piece and the shaft being to insure that the former be stronger than the other part of the shaft. A 4-in. opening was left between the shaft and the extension. The weld collar left on was 16 in. wide and 21½ in. in diameter; 2500 lb. of railroad thermit was used.

A novel departure of thermit welding from the field of repair work into the domain of pure manufacturing was embodied in a crankshaft, Fig. 3, recently made by the Baltimore Engine Co., Baltimore, Md. This company, being unable to procure a forged steel crankshaft at a time when it urgently wanted one, actually

manufactured an entirely new six-throw crankshaft by taking a series of steel billets, placing them in proper alignment with each other so that the billets formed the sections for main journals and the offset pins of the crankshaft, while the thermit metal formed the slabs which connected the pins and journals and also the circular discs at each end of the shaft. This is the first time it can be recalled that a new crankshaft has been manufactured in this manner, but there seems to be no reason why the performance should not be repeated in other plants where a quick installation is required and when the article cannot be obtained immediately from outside sources.

British Electric Steel and Swedish Iron

The subject of greatest interest to the Swedish iron trade just now is the export of quality iron, says the *London Ironmonger*. On account of the blockade, countries which formerly imported this iron have had to utilize their own resources, which has been done by electric refining processes, especially in Britain and America. Sheffield, which for years was one of the most important users of Swedish steel, and which formerly had only three electric steel furnaces, now has 80. The question now is whether these electric furnaces will be able in the future to compete with Swedish steel. The electric iron industry, it is believed, has come to stay, and Sweden will undoubtedly feel its competition, although it is a question whether in all ways it will be able to displace the Swedish material. The Swedish makers must not be blind to the danger threatening their export market for quality steel, a danger which the war has brought very near. Sweden had always endeavored to meet its own home demand, but the

possibilities of doing this in the future have been decreased by the war. The manufacture of ordinary iron is based on certain fuels, and it is possible that the high prices for these may continue for a long time. To this difficulty must be added high transportation costs and a future depression of the iron market generally.

No Improvement in Structural Lines

The bridge and structural shops of the country are facing a continued lack of new orders. In February the entire tonnage booked by the fabricating plants amounted to only 22,500 gross tons, or but 12½ per cent of capacity, according to the records of the Bridge Builders' and Structural Society, 50 Church Street, New York, collected by George E. Gifford, its secretary. This tonnage is only 900 tons greater than was booked in January. New orders in February, 1918, were 55½ per cent of capacity; in 1917, 59 per cent; in 1916, 75 per cent; in 1915, 30 per cent; in 1914, 62 per cent; in 1913, 75 per cent, and in 1912, 56 per cent, an average of 59 per cent for the 7-year period.

Reductions in Iron and Steel Prices

Manufacturers Confer with Industrial Board

New Schedule Announced After Chairman Peek Talks with Attorney General Palmer—
Government Buying in Large Volume Not Probable at Early Date—Much
Time Devoted to Discussion of General Conditions—Recommendation That Wages Be Maintained

WASHINGTON, March 25.—Reductions in iron and steel prices, ranging from \$7.25 to \$15 a ton under the prices of Nov. 11, and from \$4.25 to \$10 under the Jan. 1 prices, were promulgated by the conference of the Industrial Board of the Department of Commerce and a special committee of the iron and steel industry.

These reductions are the first step in the effort of the Government authorities to lower the prices of basic commodities to a point that will stimulate consumption. The idea, as originally outlined by Secretary Redfield almost six weeks ago, was to agree upon prices which would be so low as to encourage prompt buying, and thus keep industries at work. Lumber is next, to be followed by brick and cement.

Whether the new steel prices, with reductions from 10 to 14 per cent, will accomplish this object is a question which neither the Industrial Board nor the representatives of the industry seemed prepared to answer with any great certainty. In the announcement of the lower prices, however, they expressed optimism concerning the result.

Government Buying

There was another point on which the statement shed little light. That was the question of the method

The only big Government factor in the situation was the possibility of increasing railroad purchases. Here, however, the failure of Congress to appropriate the \$750,000,000 revolving fund crippled possible buying. The Railroad Administration itself has been compelled to announce that it must confine its funds to current expenses, although an order for 500,000 tons of rails, for "maintenance," is expected at once. This leaves any real purchasing program to the individual railroads. As these are in a position where they will have to borrow money to pay their dividends, because of the lack of Government funds to pay the rentals, additional borrowing for construction programs will probably be difficult.

The Navy Department has succeeded in getting \$10,000,000 together to help out the railroads by paying its bills. In the same way the War Department has now "shifted funds" sufficiently to squeeze out \$100,000,000 for the same purpose. But even these sums will go into the working capital fund of the administration. Any surplus would be absorbed by dividends and interest payments before it could become available for large construction programs. If this view of the situation proves correct, the chief buying to be

New Schedule of Prices

	Nov. 11 Price	Last Price	New Price	Reductions	
				From Nov. 11	From Last
Pig iron, basic.....	\$33.00 G. T.	\$30.00	\$25.75	\$7.25	\$4.25
Billets, 4-in.	47.50 "	43.50	38.50	9.00	5.00
Billets, 2-in.	51.00 "	47.00	42.00	9.00	5.00
Sheet bars	51.00 "	47.00	42.00	9.00	5.00
Slabs	50.00 "	46.00	41.00	9.00	5.00
Skelp, sheared	3 25 cwt.	3.00	2.65	12.00 N. T.	7.00 N. T.
Skelp, universal	3.15 "	2.90	2.55	12.00 "	7.00 "
Skelp, grooved	2.90 "	2.70	2.45	9.00 "	5.00 "
Merchant bars, base.....	2.90 "	2.70	2.35	11.00 "	7.00 "
Sheared plates	3.25 "	3.00	2.65	12.00 "	7.00 "
Structural, base	3.00 "	2.80	2.45	11.00 "	7.00 "
Wire rods	57.00 G. T.	57.00 G. T.	52.00 G. T.	5.00 G. T.	5.00 G. T.
Plain wire	3.25 cwt.	3.25	3.00	5.00 N. T.	5.00 N. T.
Nails	3.50 "	3.50	3.25	5.00 "	5.00 "
Black sheets No. 28.....	5.00 "	4.70	4.35	13.00 "	7.00 "
Blue annealed No. 10.....	4.25 "	3.90	3.55	14.00 "	7.00 "
Galvanized sheets No. 28.....	6.25 "	6.05	5.70	11.00 "	7.00 "
Tin plate, 100-lb. box.....	7.75	7.35	7.00	15.00 "	7.00 "
Tubular products	3½ points	more off card			7.00 "
Hoops—Base	3.50 cwt.	3.30	3.05	9.00 "	5.00 "
Light rails	3.00 "	2.70	2.45	11.00 "	5.00 "
Rails, standard Bessemer.....	55.00 G. T.	55.00 G. T.	45.00 G. T.	10.00 G. T.	10.00 G. T.
Rails, standard open hearth.....	57.00 "	57.00 "	47.00 "	10.00 "	10.00 "
Iron ore	No change				

Basing points and differentials unchanged. Prices effective at once.
Abbreviations: G. T., gross ton; N. T., net ton; cwt., hundred pounds.

by which the lower prices were to be converted into a decisive increase in business. A general impression that the Government would jump into the field with large orders seems to have little foundation. Neither the War Department nor the Navy Department is in a position to do any greater amount of buying at a low price than it would have done at the original. The Shipping Board has considerable stocks on hand, and its new building program is still a matter of speculation.

stimulated by the new prices will be largely from private sources. The one big factor will be construction work. Here again the failure of Congress to act upon important appropriation bills will prove a delaying factor.

Policy as to Wages

The announced policy of the Industrial Board that the wages of labor must not be touched under any policy of stimulated consumption seems likely to make

itself felt in slowing up possible construction work, for the price of material is only a part of the cost of building.

The authorities at Washington, however, are indulging in little comment on the situation. Neither is Washington in a position to comment intelligently on the effect of the price reductions. The schedule, as issued, was given out as the work of the committee of the industry approved by the Industrial Board. The latter claimed to have made some changes in the industry's list, but nothing was given out to indicate what these changes were. There seems considerable doubt that they were important. The list itself is taken to be the work of the industry, although it took almost three days to get the Government representatives and the industry's committee together.

Everything that was done was carried on behind closed doors and under all kinds of pledges to secrecy. The sessions themselves gave considerable evidence of exciting times. Occasionally there was apparently a most vigorous difference of opinion among the representatives of the industry themselves, and between these and the Government board.

The chief delay in the promulgation of the figures seems to have been the result of the fact that lower schedules would fall with disastrous effect on the high-cost producers. Neither the Government nor the industry seemed willing to accept the responsibility for such a result. The high-cost men themselves were naturally averse to a program that would paralyze their plants. They preferred to take their chances with the normal outcome of the law of supply and demand, hoping to get orders of some kind at living prices while the general adjustment was being worked out.

To this the Government board's contention was that the whole procedure was intended to put the law of supply and demand to work again, and that the acceleration of this procedure was of first importance to the whole country, even though the speed of the operation might cause individual injury.

The statements given out both by the Government board and by Judge E. H. Gary for the representatives of the industry, touch upon this difference. Both hint at "sacrifices," but neither suggests a way around the sacrifice.

The Higher-Cost Companies

Charles M. Schwab of the Bethlehem Steel Co. came into the conference on the second day to emphasize the importance of avoiding as far as possible the paralysis of the higher-cost producers. Judge Gary of the Steel Corporation, President Farrell and Mr. Schwab were chief intermediaries between the Industrial Board and the representatives of the industry.

John A. Savage, Duluth, who appeared for the Lake Superior Iron Ore Association, succeeded in convincing the board that there should be no change in the price of ore unless the ore carrying rate from mines to upper Lake docks is lowered.

One of the delaying factors in the promulgation of the reduced prices was the fear of the steel men that the Department of Justice might not look with approval upon an agreement which, on the face of it, seemed to violate the Clayton and Sherman anti-trust laws. This question was raised when Secretary Redfield first proposed to join the action for lower prices. At that time Secretary Redfield announced that the matter had been threshed out at length in cabinet sessions with Attorney General Gregory. To emphasize the acquiescence of the Department of Justice, Edward T. Quigley, who represents the attorney general as assistant counselor for the Department of Commerce, participated in the conferences. But in the meantime A. Mitchell Palmer had succeeded Attorney General

Gregory. The various conferees feared that he might not consider himself bound by the attitude of his predecessor. As a result, the final action of Chairman George N. Peek of the Industrial Board before the issuance of the price schedule, was a personal conference with Mr. Palmer. Both Mr. Palmer and Mr. Peek refrained from public announcement of Mr. Palmer's indorsement, but this was inferred from the subsequent publication of the prices.

One of the difficulties of the whole program of helping the industry by this price agreement has lain in the long delays of the preliminaries. It was early in February that Secretary Redfield made public his program as a method of solving the serious labor problem. It took a week to get President Wilson's cabled sanction. Then it took more weeks to find the men who were willing to sit on the Industrial Board. Then it took another week to secure the co-operation of the steel industry. Finally, after two informal meetings in New York, with Chairman Peek, a session was scheduled in Washington for March 12. Then Judge Gary was taken ill, and the meeting had to be postponed until March 19.

When the committee of steel men reached Washington last Wednesday there seemed still to be a lot of preliminary discussion. They spent all Wednesday morning talking things over with the board in the conference room of the old War Industries Board. At the end of the morning session the Industrial Board gave out the following statement:

Industrial Board Statement

"After meeting with the leaders of the iron and steel industry, representing approximately 90 per cent of the country's production, the Industrial Board announced that satisfactory progress has been made, but that a final decision on a lowered scale of prices would not be reached until after full consideration of all phases of the subject.

"The question of prices was not touched upon at the first conference. The entire time was devoted to a discussion of the general situation and the advisability of a reduced schedule of steel prices at the present time in order to stimulate buying.

"We found the steel men entirely willing to co-operate in making effective any program that will hasten the return of normal conditions," said George N. Peek, chairman of the Industrial Board. "It is as yet impossible to tell just how long it will take to formulate the new price schedule."

Thereupon the representatives of the industry retired to the Willard Hotel for a further conference among themselves. They spent all the afternoon talking things over. At the end of the afternoon the steel men sent word that they would be ready to meet the board Thursday morning. Thursday morning they still were talking. It was Thursday afternoon before the board and the steel committee held their joint session. In the meantime, Mr. Schwab had been sent for.

Thursday afternoon and evening were consumed with alternate meetings of the Industrial Board and the steel men, with Messrs. Gary, Farrell and Schwab sitting first with one conference and then with the other. It was 10.30 o'clock Thursday night before a final agreement had been reached, but this neither the board nor the industry's committee wanted to discuss. Finally the newspaper men prevailed upon them to make public at least a partial list of the price changes, and this was done. At the same time Judge Gary gave out the following statement:

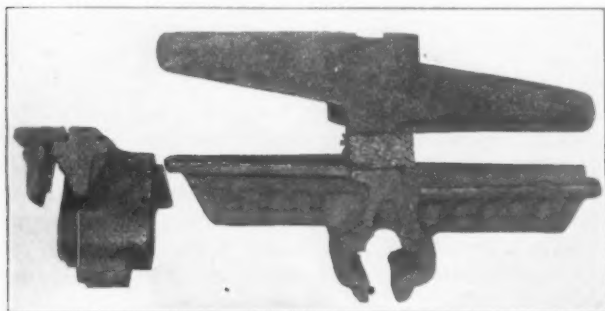
"We have agreed upon prices. We cannot give you a full statement regarding these prices until tomorrow, when one will be prepared for the press.

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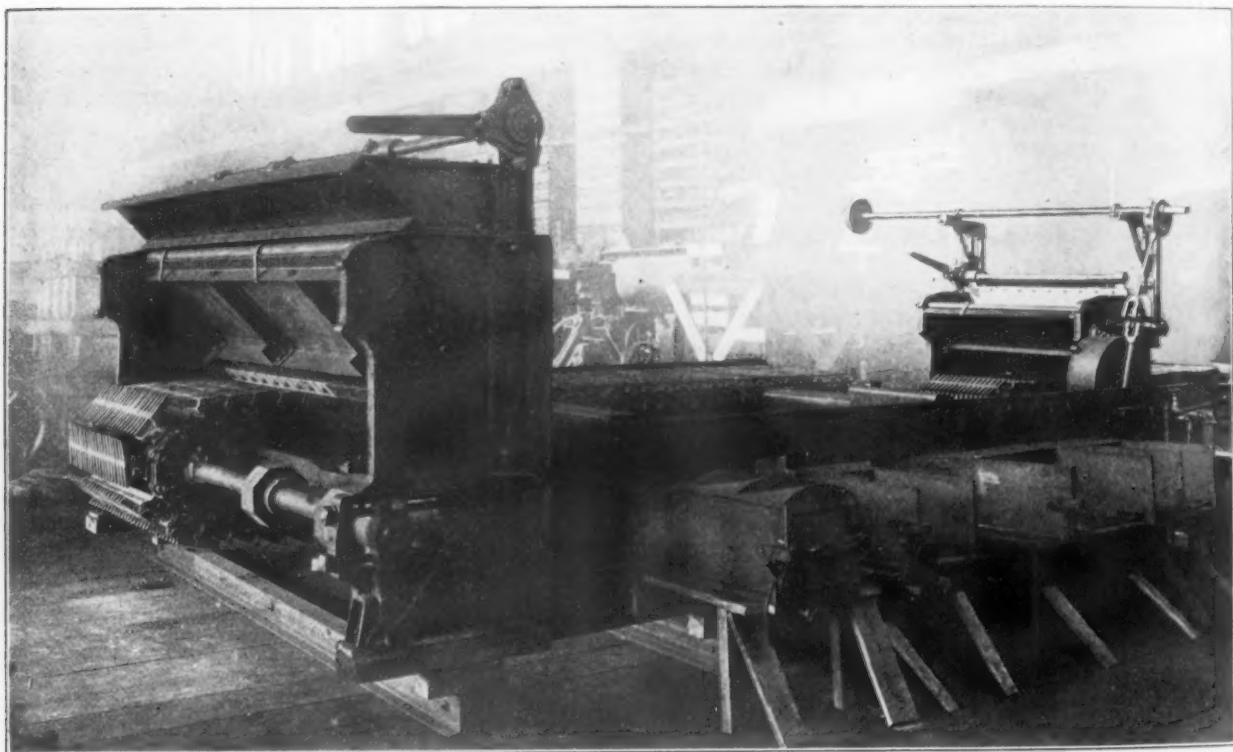
STOKERS TO BURN COKE BREEZE

Non-Sifting Grate Gives Blast Tortuous Passage —Air Control by Separate Compartments

Two mechanical stokers specially designed for the Northwestern Iron Co., Mayville, Wis., to burn coke breeze, have been completed by the James A. Brady



Section. Plan and Elevation of Non-Sifting Type of Grate Bar Used in the Harrington Special Service Stoker, Two of Which Have Been Built for Burning Coke Breeze at the Plant of the Northwestern Iron Co., Mayville, Wis. The bars overlap, giving a tortuous air passage and preventing the falling of fine fuel into the air compartment below



Forced Draft Is Regulated or Natural Draft Admitted to the Harrington Stoker by Air Boxes Set Over Air Ducts. Removing a door and closing its respective damper gives natural draft. There is an air box and damper for each of the several compartments into which the grate area is divided, thus to give each part of the grate the amount of air it requires

Foundry Co., Chicago. The stokers contain a non-sifting grate, which the designer, Joseph Harrington, emphasizes as a feature fundamentally new and of vital importance to power plant operators. The sectional view of the non-sifting grate bar shows how one bar projects under the overhanging part of another. Tests have demonstrated that fine sand will not go through. The bars are made of gray iron.

The stoker has a traveling grate, and is designed for both forced blast and natural draft. Preliminary to designing the stoker Mr. Harrington compiled the following conditions as necessary to be met before forced draft could be successfully used:

- 1.—The stoker must allow the fuel to remain quiet during the combustion period in order to avoid the formation of clinkers that cause any disturbance of the fuel bed when the ash content is in a plastic condition.
- 2.—To avoid the accumulation of refuse in the furnace and consequent fouling of the grate surface, it must be discharged as formed, so that the ash remaining on any unit

section of the grate surface is that which results from the burning of a single unit of fuel.

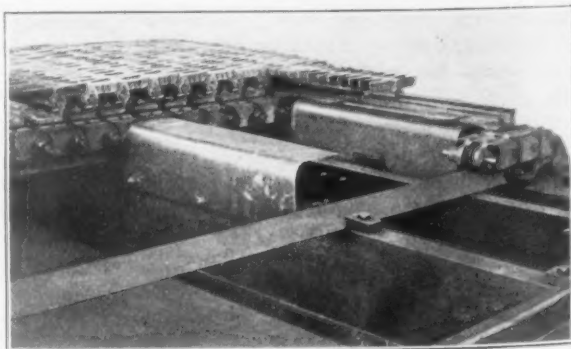
3.—There must be no air spaces that are not periodically and completely cleaned by the automatic operation of the adjacent parts and disengagement of any clinker which may have entered the air spaces during its previous passage through the furnace.

4.—Inasmuch as the fuel bed does not require the same volume or pressure of air throughout its extent, the stoker of the future must be divided into compartments in such a manner that the air pressure and volume in each compartment is suited to the requirements of the fuel passing over the compartment.

5.—To avoid the wasteful use of steam-driven auxiliaries, the stoker must be readily converted to the natural draft type during the low load periods.

6.—Parts subjected to the heat and fusing action of direct fuel contact must be readily replaceable and subjected to no mechanical stress other than its own support and the support of its portion of the fuel bed.

The stoker consists of cast-iron side frames, carrying the driving gear, hopper front shaft, and feed gate in the usual manner. The side girders are formed of structural steel members, built like a truss, permitting stokers of 20 ft. in length to be built. Transverse members of structural steel support a series of tracks on which run semi-steel chains carrying and supporting the grate surface and taking up the stress and tension of the chain. These are provided with V-rollers to



Partial Assembly of a Stoker Made in Three Sections, Each of Equal Width. Conspicuous are the tracks on which run the V-rollers carrying the chains to which in turn are attached the racks holding the bars. Also noticeable are the air seals between the air compartments, as well as the wide and unobstructed space for the passage of air, making it possible to use relatively low velocities.

insure alignment both horizontally and vertically, and to reduce the power required for driving the stoker. Attached to the chains is a series of transverse racks or beams on which the clips or bars forming the grate surface are attached.

The grate bars are made so they will slide readily over the ends of the racks. The straight under surface of the racks makes possible a practically air-tight diaphragm or seal between the adjacent compartments, these occupying the entire space between the chains and communicating on one or both sides to the air duct in the boiler side walls or below the floor of the boiler room.

An adjustable damper serves to control the air pressure in the respective compartments. The communicating passages through the side walls terminate in a removable door. When the door is taken off it allows free access to the chambers, so that the mere closing of the damper and the removal of the door serves to put the stoker on a natural draft basis. A reversal of the process converts it to a forced blast stoker.

In connection with the non-sifting grate it is pointed out that the construction provides a tortuous air passage, having a horizontal section, which prevents the flow of fuel through the grate, while there is no restriction to the free flow of air to all parts of the upper grate surface. The stokers just completed were designed to burn fuel 80 per cent of which will pass through a 1-in. round hole. They are adaptable to the use of low velocities and an equal distribution of air is possible over large areas. In stokers of this type nearly 60 lb. of coal per sq. ft. per hr. has been burned, and it is expected that this new stoker will burn 75 lb. of coal per sq. ft. per hr.

Engineering Advertisers' Association

Advertising and sales managers representing manufacturers in various engineering lines have organized the Engineering Advertisers' Association at Chicago, with the following officers: President, H. L. Delander, advertising manager, Crane Co.; vice-president, H. Colin Campbell, director advertising, Portland Cement Association; secretary, G. H. Eddy, publicity manager, Green Engineering Co., East Chicago, Ind.; treasurer, Edward J. Pratt, advertising manager, Kellogg Switchboard & Supply Co.

The Engineering Advertisers' Association will be dominated by its active membership, although provision is made to accept as associate members, publishers and their representatives, solicitors and service agency men whose interests are confined to engineering projects.

Waste Material Dealers Hold "Liberty" Banquet

The decision to change its headquarters from Boston to New York was made at the meeting preceding the sixth annual banquet of the National Association of Waste Material Dealers at the Hotel Astor, New York, March 19. F. W. Reidenbach of Rochester was elected president in place of Emanuel Salomon. Over 300 members sat at the banquet tables in the north ballroom, decorated with two huge electric signs in national colors, spelling "Liberty" and "Victory." The speakers were Dr. Willis Fletcher Johnson of the New York Tribune, who outlined the country's former stands on "entangling alliances"; Captain Thomas Harrigan of the 77th infantry of New York, composed of 42 races and creeds, who paid tribute to the 100 per cent Americanism of his cosmopolitan regiment; and Senator David I. Walsh of Massachusetts, who spoke about the more serious aspects of a victory.

The Electric Steel Co. of Indiana, Indianapolis, has recently completed an addition to its foundry, immediately adjacent to the Heroult electric furnace, to house a chemical laboratory. The addition consists of a detached one story building and is fully equipped with complete chemical apparatus for the analysis of melting stocks and alloys. Space is also provided for photographic work.

Changes in the American Metallurgical Corporation

At the annual meeting of the American Metallurgical Corporation, Franklin Trust Building, Philadelphia, held during the past month the following changes in executive control were made: S. R. Vanderbeck was reelected as president, F. J. Ryan was elected vice-president and treasurer, and to continue as general manager, and S. H. Curbacker becomes secretary. Changes in the management were as follows: F. H. Shaw, who had been in charge of purchases and accounting, goes to the plant at Conshohocken, Pa., as office manager, while James L. Hawley, recently auditor for Saxman Coal & Coke Co., Philadelphia, succeeds Mr. Shaw. T. B. Bechthey becomes superintendent of construction. H. A. Horner, recently with the Midvale Steel & Ordnance Co., will be in charge of the metallurgical department, and H. A. Morlock, formerly in charge of heat-treating equipment at the Watertown Arsenal, will have charge of equipment operation.

New business on hand includes additions to the aircraft plant at Shelby, Ohio, 15 Ajax-Wyatt brass furnaces for the Ajax Metal Co. and special heat treating investigations for the Ball Rolled Tube Co., New York. Additional land had been secured at Conshohocken, Pa., and contracts are being let for the installation of a practical operating furnace laboratory where experimental heats up to 700 lb. can be taken off under conditions to obtain practical deductions.

The Testing Society's Meeting

The American Society for Testing Materials will hold its 22d annual meeting at Atlantic City, N. J., on June 24-27, with headquarters at the Hotel Traymore. A feature of the program already announced is a topical discussion on magnetic analysis which is expected to develop valuable information. A number of committees will recommend new standards for publication as tentative and reports will be made on several important investigations which have been conducted by committees. The present membership of the society is 2372 as compared with 2261 at the last annual meeting.

The society is participating with other engineering organizations in the work of the American Engineering Standards Committee which was organized in October, 1918. Two A. S. T. M. standards, namely those for Portland cement and those covering fire tests of materials and construction, have already been adopted by the standards committee as "tentative standards" with a view finally to their adoption as American standards.

On the invitation of the United Engineering Society the American Society for Testing Materials has become a member of Engineering Council, in which there are now five other member societies, and has designated Albert Ladd Colby, South Bethlehem, Pa., as its representative in the council.

The Industrial Commission of Ohio has ordered placed in effect on April 1 the general safety standard code for work shops and factories in that state, which has been under consideration for the past year or more. This code includes safety regulations for railings, tow boards, gear guards, belt guards, belt shifters, machinery control, flywheel guards, ladders, boiler walks and counterweights. The action of the board makes the code a law of the state, and its provisions will be enforced in a similar way to other work shop and factory laws.

The St. Louis local of the Jovian Order has changed its name to the St. Louis Electrical Board of Trade, and has recommended that the national Jovian organization change its name to the International Electrical Board of Trade. The recommendation was approved at a meeting in St. Louis of Jupiter's Cabinet, the executive body of the Jovian Order, and the proposition will be voted on at the next convention of the order. The change in name is the first step in a reorganization of the Jovians with the view of emphasizing the business rather than the social purposes of the order.

KENTUCKY FLUORSPAR MINING

Post-War Conditions in the Steel Trade May Reduce Output Too Far

BY E. V. RAWN*

The condition of the spar producing industry in the Kentucky field is well worthy of the consideration of the steel industry at large. As is well known this field has shown a very large increase in production in the last four years, and it has now attained a position where the production and shipping to the steel manufacturers of the country approximate 60,000 tons of spar per annum.

The Kentucky field, in connection with the Illinois field, produces approximately 90 per cent of the spar mined and consumed in the United States. The Illinois production comes very largely from two mines, located in Hardin County; that from Kentucky comes from ten or twelve mines, scattered over Crittenden, Caldwell and Livingston Counties, but chiefly located in Crittenden County.

Since the signing of the armistice, practically no new business has been booked in this field, with the result that 75 per cent of the mines have discontinued production and shipping. There is no storage of spar in the district worth speaking of, and owing to lack of employment the mining organizations of the districts, composed very largely of native labor, are leaving the mine settlements and returning to their homes.

Status of Kentucky Mines

The mining conditions in the larger numbers of mines in the district are of that peculiar nature which make shutdowns exceedingly costly and destructive, as the greater portion of the spar mined comes from deposits lying between slickensided clay walls, which, having once been exposed to the action of air in the entry openings for mining purposes, are exceedingly difficult to support, and particularly susceptible to injury in the event that the ground waters encountered are allowed to rise and saturate them—a condition very liable to arise if the mines are closed down for any considerable period.

The large percentage of spar consumed in the United States, coming from Illinois and the Kentucky field jointly, would suggest the idea that owing to the importance of spar in the open-hearth steel industry, any misfortune to these fields, resulting in a heavy decrease in production, especially if this decrease in production becomes permanent, would be very disadvantageous to the steel industry.

Stimulation of War Prices

The prices realized on spar during the last two years have been very attractive, resulting in a considerable influx of persons who have endeavored to reap profits from a venture that on its surface appeared to give promise of large returns. The significant point in connection with the large endeavor to create new mines is the fact that so far as the writer knows, no new property has been developed with a capacity of 2000 tons per annum or greater, and very large numbers of those who have ventured in the spar prospecting line will probably, owing to insufficient capital, and in many cases to lack of experience, combined with an unavoidably high cost of production, be considerably disappointed with their venture.

Production costs have gone up enormously within the last four or five years, due in the main to high cost of labor and materials, combined with a further fact that practically all of the easily mineable spar had been taken out in previous years, when the Kentucky field,

operating under the disadvantage of long wagon hauls over bad roads, was not able to compete with other producers on any other basis than to skim the cream from their properties.

Pre-War Prices Unprofitable

A survey of the field in the early part of the year 1917 showed that the pre-war prices existing on this product were entirely inadequate to maintain production. At least 90 per cent of the capital invested previous to this time in the spar field resulted in a loss of the total capitalization of the company involved, and the field as a whole presented a very discouraging appearance to prospective investors. It is probable, however, that with a return of peace prosperity to Europe it will be found that rapid increase in the percentage of open-hearth steel produced in France, Germany and England will cut off from the United States such spar as in previous years has been exported by Europe.

Twenty years ago the ratio between production of open-hearth and Bessemer steel in this country was practically one of open-hearth to three of Bessemer. The figures are now reversed, and a further promising market appears to exist in the large number of electric furnaces being installed.

For the past 90 days the steel people have been very reluctant to place any orders at all for spar. It is to be expected, however, that this policy will not be carried to the point of causing so serious a decrease in production that on the resumption of the demand the supply will have decreased so far that the demand cannot be filled.

"Wild-catting" by Tungsten Companies Vigorously Denounced

WASHINGTON, March 25.—The official documents of the Geological Survey, usually so cold, have been enlivened by a rigorous denunciation of "wild-catting" by tungsten companies.

In a special report on tungsten and other rare minerals, Frank L. Hess lays special stress on the questionable speculations which resulted from soaring prices for this metal.

"The prices of tungsten ore, caused by the great need for high-speed steel tools to cut war steel for the European governments," he reports, "were romantically high and were of the phenomena seen only once in a lifetime."

"The great interest in tungsten caused by the unheard-of prices gave promoters of all degrees of honesty a chance to float companies, and the names of engineers of high standing were used in schemes which never had a reasonable basis for being. Companies were organized for millions, and one such company, with only a few questionable claims but with the name of a well-known engineer on its letter head, is said to have actually sold its stock at 50 per cent premium. Other questionable companies, which seemed previously to have about exhausted their list of credulous buyers, were given a new lease on life and took hundreds of thousands of dollars from the gullible part of the public."

Getting back to technical subjects, Mr. Hess criticizes the proposal to keep ores on a 65 per cent basis.

"The demand," he says, "that the tenor of ores be raised to 65 per cent or more of WO₃ is in general a careless, wasteful demand, probably founded partly on inexperienced metallurgy, partly on the supposition that the miner must foot the bill, and partly on the ground that it is poor business to transport 40 per cent of inert material when only 35 per cent or less need be carried, and that it costs more to smelt 60 per cent ore than 65 per cent ore."

The Interstate Iron & Steel Co. has established new quarters for its Detroit office at 505 Real Estate Exchange Building, in charge of R. B. Dutch.

*President Southern Mineral Co., Hopkinsville, Ky.

Change in Rail Specifications Proposed

American Railway Engineering Association
Meets at Chicago—Results of Experiments
on Gaggling and Testing Rails Disclosed

THE annual convention of the American Railway Engineering Association was held at the Congress Hotel, Chicago, March 18, 19 and 20. From the standpoint of attendance and keen interest in the proceedings, the meeting was the most successful in the history of the organization. Last year the pressure of war work kept many away, and the year before a threatened railroad strike had a like effect on the attendance. Registrations of members on the second day totaled 474, and of guests 167.

The officers elected for the coming year include: President, Earl Stimson, general superintendent maintenance of way, Baltimore & Ohio, Baltimore; first vice-president, H. R. Safford, engineering assistant to regional director, Central Western region, Chicago; second vice-president, J. A. Atwood, chief engineer, Pittsburgh & Lake Erie, Pittsburgh; treasurer, G. H. Bremner, district engineer, Division of Valuation, Interstate Commerce Commission, Chicago; secretary, E. H. Fritch, Chicago; directors, Charles F. Loweth, chief engineer, Chicago, Milwaukee & St. Paul, Chicago; F. L. Thompson, chief engineer, Illinois Central, Chicago; Hadley Baldwin, assistant chief engineer, Cleveland, Cincinnati, Chicago & St. Louis, Chicago.

In an address opening the convention, Charles A. Morse, the retiring president, declared the great variety in rail sections absurd and urged the association to renew its efforts in the interests of greater uniformity. About two years ago, the organization made recommendations to the American Railway Association for but seven sections between the weights of 70 lb. and 130 lb. per yd., and yet there are being ordered to-day about 50 different sections of rail between these weights and 12 different sections of 100-lb. rail alone are being rolled.

Revised Rail Specifications Proposed

The Committee on Rail submitted revised specifications for rails which were ordered published in the proceedings of the association for consideration and discussion during the ensuing year. In the discussion of the committee's report, the chairman announced that it was the intention of his body to ask rail manufacturers to a meeting, probably in the near future, to get the benefit of their opinions on the proposed changes. The recommendations regarding rail specifications are as follows:

The manganese is raised 10 per cent in both lower and upper limits in open-hearth rails, making the proposed requirement 0.70 to 1.00 per cent.

For open-hearth rails 111 lb. per yd. and over the carbon is made 0.67 to 0.80 per cent, an increase of 0.05 per cent for the heaviest class of rails.

For open-hearth rails the acceptance analysis is made on a sample from the finished rail instead of the ladle test ingot.

The bending of the rail in the physical testing may be accomplished by either the drop test or the quick bend test (hydraulic bender), as agreed upon in the contract.

The elongation is required to be at least 8 per cent in one inch instead of 6 per cent.

Three test pieces for bending are selected from each heat of open-hearth rails and all three are required to meet the requirements.

The committee also reported that to determine a means of decreasing the pressure required to gag a rail, Dr. P. H. Dudley, New York Central lines, has been making experiments at several mills with the supports in the gag press increased from the usual spacing of 42 in. to spans up to 60 in. Curves of the relation between the distance between supports and the load required to produce permanent set show that the load decreases as the span increases, and consequently the local pressure of the bending die and the distortion of the metal at

the point of pressure would decrease. Some experimental work has been done in gagging rails with the longer spans and the committee hopes to have some developments to report at a later date.

It was announced that the Pennsylvania Railroad had continued work with the hydraulic or quick bend method of testing rails. This method, it was stated, seems to be preferable to the drop test, in that it gives more complete information, is quicker of operation and the breaks also are practically always normal tension breaks of the part in tension, which is frequently not the case in the drop test. For these reasons it has been included as an alternative method of testing rails in the proposed specifications for steel rails submitted with the committee's report.

Another method that is being tried for the examination of the interior condition of rails is the process of deep etching of longitudinal sections, in strong acid. The Altoona Laboratory has examined some longitudinal slabs about $\frac{1}{4}$ -in. thick, cut from the interior of the head of transverse fissure rails, by keeping them for two hours in a hot mixture of hydrochloric and sulphuric acids. The committee has modified this method by taking a $\frac{1}{4}$ -in. slab consisting of the top part of the head. This slab is etched or pickled for 30 to 45 min. in strong commercial hydrochloric or muriatic acid in a large porcelain dish and kept at a temperature of about 180 deg. Fahr. The committee expects to have some results from these examinations to report at a later date.

Rail Failure Statistics

With regard to rail failures the report of the Committee on Rail included the following:

"The average failures per 100 track miles of the rollings for the several years, including both Bessemer and open-hearth rails, are given herewith. This summary includes statistics from reports for the years 1913 to 1917 inclusive.

Year Rolled	Years Service				
	1	2	3	4	5
1908.....	.....	.....	.....	.....	398.1
1909.....	.....	.....	.....	224.1	277.8
1910.....	.....	.....	124.0	152.7	198.5
1911.....	.....	77.0	104.4	133.3	176.3
1912.....	28.9	32.1	49.3	78.9	107.1
1913.....	12.5	25.8	44.8	69.5	.....
1914.....	8.2	19.8	32.9	.....	.....
1915.....	8.9	19.0	.....	.....	.....
1916.....	11.8	.....	.....	.....	.....

"It will be noted that the 1908 to 1912 rollings show successively decreased numbers of failures compared on a basis of five years' service, and the rollings of 1913 and 1914 also show successively decreased failures when compared on a shorter period of service. The more recent or 'war-time' rollings, however, are not starting out so well, but what the final performance will be can only be told after they have been in service a sufficient length of time."

In connection with the convention of engineers, there was held at the Coliseum the usual annual exhibit of railroad appliances and track supplies.

The Wellman-Seaver-Morgan Co. is now holding in co-operation with the Cleveland Trust Co. an educational exhibit on the bank's property at the corner of Euclid Avenue and East Ninth Street, Cleveland. A 200-ton tire applying press has been installed and demonstrations are given of the actual mounting and demounting of automobile tires. The exhibit is arranged with oil painted posters and is flood lighted at night.

Ellenwood & Doyle, jobbers in tin plate, black and galvanized sheets, brass and metals, have opened offices and a warehouse at 29 Great Jones Street, New York.

LARGE PLATE MILL FOR JAPAN

World's Second Largest Machine Built by the Morgan Engineering Co.

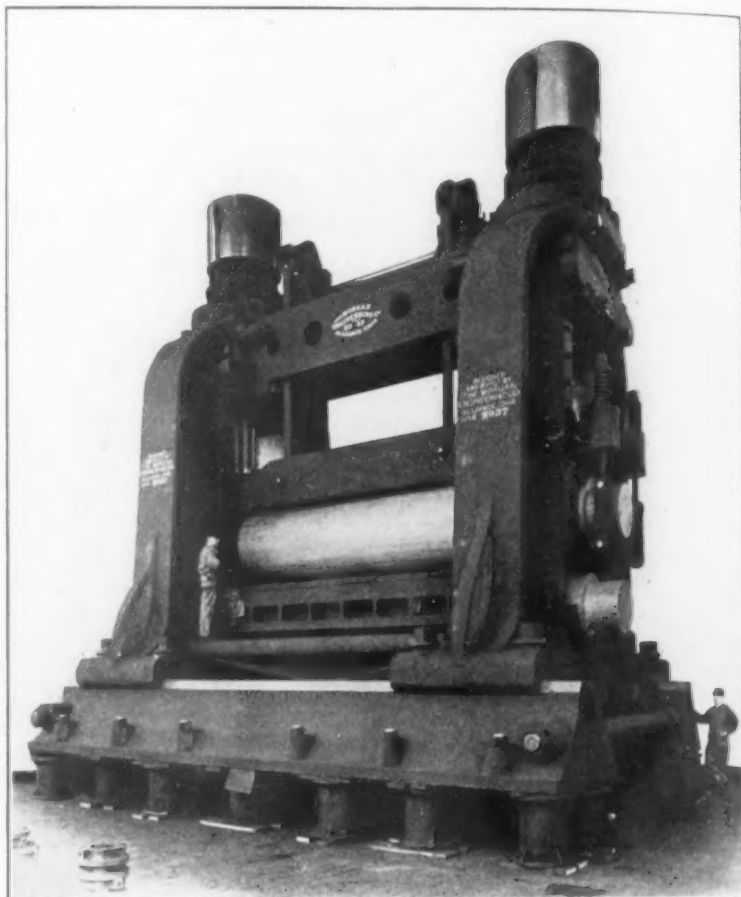
A 180-in. plate mill, the largest ever built with the exception of the 204-in. mill recently placed in operation by the Lukens Steel Co., has recently been completed by the Morgan Engineering Co., Alliance, Ohio, which designed and built it for the Imperial Steel Works, Kobe, Japan. The Morgan company also built the mill tables.

This is a standard two-high mill designed to roll plates up to 180 in. in width and up to 2 in. in thickness. The illustration shows the completed mill ready to be dismantled for shipment. Its overall height is 30 ft. 3 in. with the rolls together, and 33 ft. 3 in. with the rolls apart. The overall width is 20 ft. 6 in. The shoes are 20 ft. 6 in. long and 14 ft. 6 in. between centers. The total weight of the mill is 592 tons.

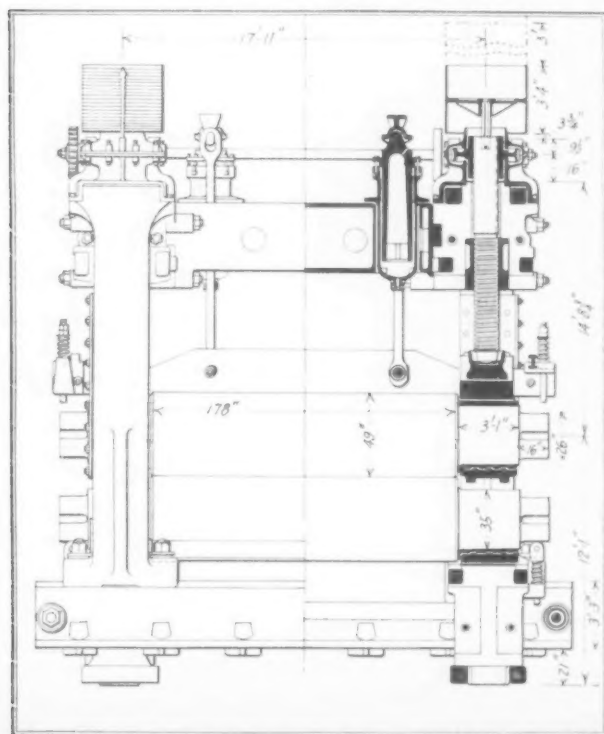
The rolls are steel forgings 49 in. in diameter by 180 in. working face, as compared with 34 in. rolls used on the Lukens mill in which chilled finishing rolls of a smaller diameter are permitted by the use of two supporting or backing rolls of cast iron 50 in. in diameter, which give the Lukens mill the required additional strength. Forged steel rolls are used because of the almost prohibitive prices asked by roll manufacturers for chilled rolls of that diameter at the time the order for the rolls was placed. The roll bearings are 39 in. in diameter and 37 in. long. The length of the rolls overall is 20 ft. 10 in. and the weight of each roll is 60 tons.

The housings are of steel castings built in two parts, as it would have been impossible to ship a housing cast in one piece. In the large Lukens mill each housing is built up in four parts. The four half housings in the Morgan mill weigh approximately 51 tons each. The housings are split vertically and are held together by large shrink links, shrink rings and bolts. There are

four shrink links on each housing, two on the outer side, one just above the lower roll and the other near the top, and two on the inner side. There are two shrink rings on each housing, one at the bottom and the other at the top. These links and rings are forged steel. The rings are 10 x 10 in. section, 6 ft. 3 in. long by 4 in. wide, outside dimensions, and weigh approximately 3 tons each. The links are 8 x 8 in. section, 7 ft. 6 in. long.



Standard Two-High Mill Designed to Roll Plates Up to 180 in. Wide and 2 in. Thick. The total weight is 592 tons.



The Cross-Section Shows the Details of the Pressure Applying Mechanism, and the Shrink Links Which Hold the Housings Together.

The main screws in the screw-down are 15 in. in diameter with $1\frac{1}{2}$ in. thread pitch. The maximum lift of the upper roll is 3 ft. The roll is balanced by hydraulic pressure of 500 lb. per sq. in. The screw-downs are driven by two 105 hp. General Electric motors equipped with solenoid brakes.

The ingots will be delivered from the furnaces to the approach table on an ingot car. This table is 39 ft. long and has 14 rollers 20 in. in diameter. The first four rollers, on which the ingots are discharged, are steel forgings, and the remainder are steel castings. The table is provided with a horizontal and a vertical manipulator, both hydraulically operated. This table will be driven by one 80 hp. motor.

The front mill table is 24 ft. 6 in. long and has 11 20-in. cast steel rollers. This table is provided with a motor operated turnover manipulator. The runout mill table is 24 ft. long and has 10 rollers. Each mill table will be driven by two 80-hp. mill-type motors. Shibauka motors of a Japanese make will be used.

The mill will be driven by a 44-in. x 70-in. x 60-in. twin tandem compound engine of the reversing type furnished by the United Engineering & Foundry Co., Pittsburgh. The drive will be direct from the engine through the pinion housing. This housing will be entirely inclosed, and will contain the reducing gears and roll driving pinions.

The Pollak Steel Co., Cincinnati, announces that the G. F. Cotter Supply Co., Houston, Tex., will represent it as southwestern sales representative, selling forgings of all kinds, axles, locomotive parts, and Pollak special heat-treated products.

Industrial Engineers Consider New Industrial Order

Intensified Economy of Labor, Together with Elimination of Fatigue—Benefits of Training Even Skilled Workmen—Opportunities for Industrial Engineering

THE dawning of a new social and economic order, largely based upon service and unselfishness, was the keynote of opinion as expressed at a national conference of the Society of Industrial Engineers, which held a four-day session at New York last week. The consensus of opinion accorded to the industrial engineer first place in the co-ordination of labor and capital, the institution of greater economy and efficiency in manufacture, and the intensification of labor saving everywhere in industry, to keep down further increases in the cost of living.

New Aspects of Industry

At the final session Friday afternoon, March 21, consideration was given to labor-saving equipment as a factor in maximum production and fatigue elimination. Dr. Lillian M. (Mrs. Frank B.) Gilbreth, Providence, R. I., in her analysis of "Fatigue Elimination," pointed out that it has developed from theoretical laboratory work, confined before the war to the physiological and psychological laboratories, to a now acknowledged position of importance in industrial arrangements. The advent of the crippled soldier in industry, the speaker declared, made necessary an even greater consideration of the problems of fatigue, and the extensive introduction of women into factories and other lines of work made it even more necessary. She showed that this increased interest in the subject was partly a result of the report of the British health of munition workers committee, which caused the general introduction of rest periods into plants there. The recent report of the industrial commission at Boston was recommended for study; but the speaker warned that the evidence submitted therein was not entirely conclusive. Praise was given to the studies of Professor Amar of France, regarding the employment of women, and exception was taken to his conclusion as regards their mental capacity for concentration.

Referring to recent studies by psychiatrists at Boston, among them Dr. Souther, Mrs. Gilbreth emphasized that their work had brought out that there was a remarkable resemblance between patients coming to hospitals for psychopathic treatment and many employees in plants. There is a distinction between psychopathic fatigue and physical, she stated, so that while a worker may not be actually fatigued in body, he may feel so mentally, and that such an attitude is liable to spread all over a plant, cutting down production.

The psychologist has come into industry to stay, she affirmed. A note of warning was sounded lest the admirable personnel work which has been accomplished by the adjutant general's department of the War Department, should be let slide, now that the war is over.

The emphasis, she believed, should be placed upon recuperation from fatigue as the crux of fatigue elimination work. In the first place fatigue should be reduced to what might be called a necessary minimum, and she urged that experts, psychologists, etc., should be kept at work in bringing this message and doctrine before employers. She expressed the hope that the point has now been reached where fatigue elimination, like safety-first has, would now become fashionable.

Shortage of Common Labor to Increase

A. Russell Bond, managing editor *Scientific American*, the chairman of the session, said that every machine, at least of the modern type, should be a fatigue-elimination device.

"The Need for Labor-Saving Equipment" was brought out by Leon I. Thomas, managing editor *Factory*, who pointed out that at plants throughout the Middle West alien workmen, to the number of 25 per

cent of their entire quota, expect to return to their mother countries, which are now looked upon as attractive republics. Such emigration indicates a coming shortage of common labor. These returning peoples, he admitted, will probably be a small aggregation as compared with the total number abroad who may be affected by barriers here against immigration.

Synchronizing with the development of a new post-war social order, he predicted there will be within the next decade a great wave of education far more comprehensive than anything that we have seen before. This movement would act to further reduce the body of unskilled. Moreover the war emergency had taken a large number of unskilled and had put them into the class of the semi-skilled. This shortage, made more certain, created a great future for labor-saving equipment.

It was the duty of the architect and engineer to meet these needs; and no field, according to the speaker, was more promising than further improving the handling of materials and in the elimination of "man-killing jobs," for example sand blasting, etc. The installation of labor-saving equipment to do away with these "man-killing jobs," done as a rule at a cost estimated greater than for the existing hand labor, has frequently resulted in a saving, contrary to estimates. For the skilled worker, mechanical aids should be provided, largely along the line of installing automatic machines, which replace a certain amount of skilled labor but require an attendant. For workers who are not able-bodied, such aids would as time goes on, act to eliminate muscle work; but such equipment should not be taken as always replacing a man. The speaker concluded with the salient question as to whether machinery cannot be made to carry the burden of idleness in dull times, instead of by laying off men. It was given as an instance that in one plant machinery used in busy times was mounted on skids and moved to storage at such periods. She added: Let us substitute machine turnover for labor turnover.

The informal talks on "experience of labor-saving equipment," which concluded the session, showed the keen general interest of the industrial engineer in labor-saving by efficient conveying of materials. H. P. Gould, editor *100%*, opening the discussion, declared that the slow spread of labor-saving devices was surprising. The engineer he believed could be of great help along these lines.

An entire year was spent in studying the process of manufacture at the Fisk Rubber Co., Chicopee Falls, Mass., according to Zenas Carter, manager Material Handling Machinery Manufacturers' Association, New York, to determine the prospect for improved handling methods. It brought out distinctly the need of a department of repairs, and the saving in the first year was found to approximate five times the cost of the survey and the repair equipment.

Responding, Mr. Gould brought out that centralization of authority in the handling of materials, trucks, etc., has been found in such cases to be a great factor in this saving.

War necessity has compelled the adoption of roller and ball bearings in the casters of the cooling tables at steel plants, according to Earl Ebey, Hyatt Roller Bearing Co., New York, for the reason that labor shortage made it difficult to find enough "huskies" able and willing to shove the plates over the table. The energy required for this work, he stated, was enormous. At the Homestead Works of the Carnegie Steel Co., he stated, the use of these bearings in the casters and wheels permitted a reduction in the number of men from five to two. Of the price of a caster, amounting to between \$2.50 and \$3, he estimated the cost of the roller bearing at about 50 per cent. This improve-

ment caused the problem to be taken up for the entire industry, he said, and set a new standard of efficiency for mill operations.

The Business Man and the Bolshevik

An open mind, according to John M. Carmody of the H. Black Co., Cleveland, is the prime qualification of industrial engineers, if they are to meet the problems of to-day. In a discussion of "The Industrial Engineer and the New Order," he brought out that they cannot afford to be behind the social program; that they are not only industrial engineers, but social engineers, who have a vastly larger field than that of mere welfare work; that it comprehends the social well-being of mankind. He deprecated the failure of daily newspapers to inform the public fully and without bias as to the trend of affairs affecting labor, capital and other economic factors. He questioned whether we have handled the Russian situation as it should be, and expressed surprise at the small number of executives and owners of industry who show any inclination to learn of the situation in that country. He regarded it as an economic revolution with a powerful effect upon its neighboring states, and declared that some effort should be made to inform us all about it. The difference between the Bolsheviks and the Soviet was not clearly understood, he stated. The management of industry should know about this subject, he felt, for the reason that many men in the shop get hold of literature along these lines which is put out by Trotsky and Lenine. He thought that Professor Lomonosoff's opinions were entitled to great consideration. He declared he was a great engineer. He pointed out that Professor Lomonosoff had said that the Russians were all agreed that, bad as the situation is, they want to work it out by themselves.

The Soviet is a new system, according to the speaker, made up of groups from similar economic sections, instead of arbitrary geographic groups as in our own political system. The public, and especially the capable industrial engineer, he stated, should study such a form of government, not necessarily with the idea that we are to adopt it, but to be prepared to handle it should occasion arise.

The Profession of Industrial Engineering

Following the informal banquet, Thursday evening, March 20, which was presided over by President L. W. Wallace of the society, speakers addressed the society and its guests on "Industrial Engineering—the Profession." Prof. Dexter S. Kimball, Sibley College, Cornell University, in defining "The Ideals of Industrial Engineering," showed that its principles were to be found in the archives of Babylonian civilization, even to such features as the minimum wage. The failure of Greek and Roman institutions he attributed to the fact that their liberties and ideals were rooted in abject slavery. He also criticized present tendencies in that we have failed as yet to grasp a broad, liberal view of social questions.

The Strength of Modern Industry

The power of modern civilization rested, he declared, in the ability to produce worldly goods in unheard-of quantities, an ability of which we have only just scratched the possibilities. He did not place beyond future accomplishments the foundry-made doughnut (applause). This capacity for production was such that he could see no reason why we cannot in the future feed the hungry and clothe the poor as no other people ever did; and he put it forward that the people themselves are beginning to form convictions such as these. Industry should be considered, he stated, as a means to support human life in the best possible way it can be done. This means a radical organization of industry if these ideas are to be adopted.

Men who are to carry on the new industrial standard, he continued, must be valued according to service, pure and simple, not wealth. The position to be taken to effect this transformation, he placed in the field of production, and the industrial engineer must know national ideas, political and economic principles, and his work must be with the capitalist as well as the laborer.

He declared that unless this problem is solved pres-

ent civilization will inevitably strew the shores of time. The key to a solution, he asserted, lies in the development of the principle of unselfishness.

"The Scope of Industrial Engineering" was outlined by John R. Dunlap, president *Industrial Management*, who showed the close connection between its development and that of the literature connected with it.

The proper basis for "The Future of Industrial Engineering" was described by Harrington Emerson, director Emerson Engineers, New York. There is still great uncertainty, he stated, as to just what industrial engineering needs. Human activity he divided into three classes, parasitical, recreational and useful. The useful activity in turn he divided into those which expend themselves through personality and materials. Personal activities he subdivided into commercial and ethical; and no employer nor any employee, he asserted, has any right, individually or collectively, to enter into any agreement that violates any of these five ethical branches of useful activities—namely, morality, hygiene, education, adaptation and industry.

A gage of the future of industrial engineering in its financial aspect was drawn by the speaker from statistics, mentioned in a previous address, which placed the value of production in the United States in 1918 at about \$75,000,000,000. Taking an estimate of efficiency of 80 per cent, this would yield an output valued at about \$58,000,000,000 or of a loss of about \$16,000,000,000, approximately \$50,000,000 per day. It is the duty of the industrial engineer, according to the speaker, to impose on the people of the United States the saving of this \$50,000,000 a day.

There is every reason in the world why industrial engineering should be accepted as a profession, according to F. C. Schwedtmann, vice-president National City Bank of New York and treasurer of the society, who spoke next on "Professionalizing Industrial Engineering." The only thing in engineering which is eternally permanent, he stated, was the plumb line, representative not only of a line drawn to the center of the earth, but symbolical of something mental or spiritual, that may be called justice. He emphasized that it occupies an important place with banking for the fact that it is a factor in deciding the virtue of an industrial proposition.

The essential needs of industrial engineering are, in the first place, a good internal organization of society, which right at the start must take upon itself the elimination of all quacks. The industrial engineer, he felt, should include some of the functions of a doctor, a minister and other professions.

Efficiency, he pointed out, is not necessarily the highest point of production; but it is that point which will make a happy nation. The engineers who will work out such problems were likened to tungsten steel; and they must be "tungsten men, men who can work at red heat and hold their temper."

A paper was also read on the "Nationalization of Engineering," by Louis C. Marburg, Marburg Brothers, Inc., New York.

Training the Executive and the Worker

"The Influence of Engineering Education" was the subject of discussion at the afternoon session, Thursday, March 20. Owing to the absence of Dean Herman Schneider of the College of Engineering, University of Cincinnati, who was to have held the chair, his place was taken by Prof. Dexter S. Kimball of Cornell University. Professor Kimball dwelt upon the influence of the war to turn everyone to the idea of education. He called this the one great idea of our civilization, for it provides, as he says, the only line along which we can hope for the progress of industry and of industrial democracy.

The Task of the Industrial Engineer

He began the session by calling upon L. P. Alford, editor *Industrial Management*, to speak upon "The Engineer's Place in Reconstruction." Reconstruction the speaker analyzed to be merely readjustment. It is a problem of labor and capital as he saw it, or more properly of laborers and capitalists; or in other words a problem of finding the condition that will establish satisfactory industrial relations throughout the world. It

is concerned with saving and reducing the labor of manufacturing, and he took the stand that the engineer must stand forward to help the community to solve these industrial problems.

Reconstruction, he stated, must go beyond the medieval idea, that it was sufficient to tell people to "be good." In the present complicated civilization, he pointed out, this is not enough; but we must show the worker the means and the way. Engineers, he declared, must be not only builders of the physical plant but also of men.

Suasion should be the lever, and he pleaded for salesmanship for the engineer as a means to effect betterment, economies, etc. The engineer's viewpoint was of value, he emphasized, in bringing together labor and capital.

A Square Deal for the Returned Soldier

The proper treatment of the returned soldier, as drawn from the experience of Canada, was outlined by Norman A. Hill, general manager Carriage Factories, Ltd., Toronto. The returned man does not care to be treated as a hero, that is after the initial reception or parade, he stated, nor does he want to be approached in a spirit of charity; but he desires only a square deal, that is an opportunity and, if you like, a preferred opportunity.

A plea was made to the industrial engineer to make provisions along these lines and to make allowances especially for the destruction of initiative resulting from military discipline from which the ex-soldier must have a chance to recover. It is not enough, he stated, to have tolerance or patience; it is necessary to give them help to get back into the stride of industry.

The tendency shown by certain manufacturers to discriminate against the returned soldier, by taking the soldier's compensation into account in fixing the pay offered him, was strongly denounced. Such compensation is not to be taken under the circumstances as a part of a man's income, but as a remuneration or compensation for irretrievable loss.

Training the Skilled and the Unskilled

"Training and Education of Workers" was then taken up by H. E. Miles, ex-president National Association of Manufacturers and chief of the training service of the Department of Labor. Over one-half the factory workers in the United States, he stated, are giving less than a half-day's fair production, amounting therefore to a loss of one-half of \$350,000,000,000. He gave an instance of one section in New England where recently there were 9000 idle mechanics. Three hundred were wanted for similar work, but only 210 of the 9000 were accepted as capable. Not one boilermaker in 10 could be recommended. He pointed out that the pathetic phase of the situation was that a very large number were almost good enough, but not quite.

Production required at the present time lower prices, a stimulation of consumption both here and abroad, and both good wages for the worker and a good profit for the employer, he said. It would be easy, he declared, to increase production in plants some 20 to 30 per cent and he emphasized the benefits along these lines of a training department. A week or two in training even experienced employees has been found usually to increase production, which in turn benefited the manufacturer by cutting down overhead. He estimated that a 20 per cent increase in production would increase output in this country \$1,000,000,000 a year and that \$1,000,000,000 more would be saved from reduction of overhead.

Referring to the Central Powers, he pointed out that the disapprobation into which they have sunk means that they will be compelled to sell goods at lower prices to those who buy from them; and that this in turn means no bettering of the price situation for the rest of the world. He declared that training is needed in all trades, not merely in the metal trade; and that the efficient thereby are being benefited 30, 50, 80 and 100 per cent. There is no question, he said, but that the workers of the country are hungry for it. He thought that the problem was subdivided principally into assistance for injured people, such as neglected

adults and training for the youths of about 14 years, the concrete-minded ones, along the lines of the new English educational program which provides training every week for a certain length of time of youths of that age and over.

He brought to the attention of the society that the United States Training Service of the Department of Labor has a considerable sum of money left which may be devoted to this work among manufacturers; but that this fund would be withdrawn within a very few months.

Education for Minor Executives

"The Training and Education of Executives" was next taken up by F. M. Simons, Jr., president Western Efficiency Society, who pointed out that internal control problems of industry must be handled from within, not from without. The Allgemeine Electricitäts Gesellschaft, he cited as a notable example of external control, by the German government. He thought it fortunate that we are not to remain under that type of external bureaucratic form of control here.

Our danger in industry rested in the possibility of industry continuing to be haphazard; and this constituted the biggest challenge to the industrial engineer to-day. The work was to educate by groups, the worker, the major executives, and the minor executives; and the channels through which this can be done are the academic institutions, the manufacturers' own plants, through consultation by a close contact with the U. S. Bureau of Standards, and finally by co-operation with societies such as the Society of Industrial Engineers and the Western Efficiency Society.

The training of the minor executive consisted, he felt, in a training in self expression, leadership and a knowledge of his own job.

Teaching Trades in the Army

The session was concluded by an address on "Standards of Engineering Education" by C. R. Dooley, manager Educational Department, Westinghouse Electric & Mfg. Co., Pittsburgh. As an example of work done along these lines by the Government, he stated that a classification of the draftees showed somewhat over 8 per cent had had a high-school education or better, that the great majority had had no continuity of training, especially in trades, and that the health of them generally was notoriously bad. Just one-half as many skilled men were found available as the army required. The U. S. Training Service was given 90,000 men from these draftees, to which training was originally given in 20 trades and ultimately in 60 trades, and that 6 months was allowed to train them. Out of this number 7000 were graduated in two months. About 167 schools were available, equipped with suitable training departments.

An exceedingly definite purpose was the striking feature of this training, he said. In different corps, for example, machinists have very different jobs to do, and were so trained. Learning by doing was the method adopted. By means of a schedule of blueprint instruction papers, called job sheets, the work was carried on. A book of questions followed, but it was stated for the benefit of the student that this book was only a guide and that it was his business to ask questions.

Special training in the army called for, in the first place, discipline, including self-control, loyalty to the job and a sense of teamwork; in the second place, the development of resourcefulness or the ability to do things in any situation; and lastly, whatever instructions it is possible to give under the circumstances. About 40 per cent of combatants it was found had to have this mechanical skill. The situation as regards industry, he concluded, calls for the manufacturer in the first place to do such training as he can within his own organization and secondly to get in close touch and co-operate with the public school system in order to get a better grade of human material.

In opening the final session, President Wallace of the society announced that sections are in process of formation at New York, Cleveland, Detroit and Chicago. It has been decided that the next conference will be held in Cleveland some time next fall.

COLLOIDAL FUEL

Problem of Combining Coal with Petroleum Fuel Oils Now Solved

The executive committee of the Submarine Defense Association at 141 Broadway, New York, has authorized the release of a statement concerning the new colloidal fuels developed under its auspices since the United States entered the war and now tested and demonstrated both for marine and industrial uses. The Submarine Defense Association was organized in June, 1917, by companies representing the shipping and marine insurance interests of this and other countries to assist in developing effective anti-submarine measures.

The report briefly outlines the situation as follows:

Pulverized coal can now be successfully held in suspension so that the colloidal liquid flows free'y through the pipes, preheaters and burners of ships and power, heating and industrial plants equipped to burn fuel oil. Months after mixing, the composites show little or no deposit. A fixateur, which comprises about 1 per cent or 20 lb. per ton, acts to stabilize the particles of pulverized coal dispersed in the oil. The fixateur and fixated oil are readily made and may be shipped anywhere. On burning the combustion is so complete that with fair coal there is left no slag and very little ash, what there is being light as pumice and granular as sand.

It is the property of colloidal fuel that without loss of efficiency per unit volume or change of oil storage or burning equipment it makes possible the conservation of at least 25 per cent of the fuel oil now burned or conversely with the oils now available it increases by 50 per cent the world supply of fuel that is liquid. One useful composite, in the range of ordinary temperatures, is composed of about half coal and half oil. Another unctuous semi-liquid is nearly three-fourths coal and one-fourth oil. All the fuel pastes are mobile to sustained and easily applied pressure and may be thus pumped, fed and atomized in the combustion chamber. These semi-fluid composites constitute a compact and safe fuel for domestic and industrial use and largely eliminate the smoke and ash nuisances of cities.

Regarding the saving of cost involved in the use of this fuel, the association's pamphlet states:

For example, with coal at \$4 per ton and oil at \$4 per 50-gal. barrel, the saving is \$2 per ton. This is an average peace condition in New York. If coal is \$5 per ton and oil \$7 per barrel, the saving is close to \$6 per ton. These savings are quite apart from the conservation of oil and reduction of transport.

Each locality may have its special composite containing the cheapest available coal, oil and other ingredients. Plants and railroads may buy from refineries any grade of colloidal fuel they desire to the prescription wanted or they may obtain the appropriate fixated oil and make the final composite themselves as and when required. No change in oil storage or burning equipment is necessary.

A demonstration test unit, to manufacture and use the fuel on land is installed in Brooklyn. The fuel made is burned for power purposes in the works. It is now to be tested at several steelmaking plants.

The largest field of use and oil conservation is in furnace work—direct fired, reverberatory, regenerative and crucible furnaces; for brick kilns, for air, annealing, bolt heading, blacksmithing, brass melting, billet heating, forging, rivet heating and open hearth furnaces now fitted for oil. About 70 per cent of the oil they now use will do the present duty of 100 per cent and do it more cheaply.

Colloidal fuel made with pressure-still residuals (oil, wax tailings, crude oil coke) is another most gratifying success. These residuals are the Cinderella products of refining. Liquid fuel so made may add in this country to each year's stock of available fuel oil many millions of barrels, without increase of oil well production or strain on rail or sea transport. From

these residuals, a fuel is prepared so low in sulphur that it will command a premium because valuable in making higher grade alloy steel.

A further research was started in blending petroleum oils and coal tars to see if it was practicable to stabilize the mixture so that free coke and asphaltic substances would not settle out but would produce a stable liquid fuel that could be shipped, piped and stored. The quest was well worth while because could it succeed one might so create annually here and in England up to 20,000,000 bbl. of superior liquid fuel without an increase in oil well production. Success is now confirmed. Thus countries without oil like Australia, France, Italy and England may themselves produce over half of the substances to make liquid fuel, and as the gas house and coke oven tars are usually cheaper than fuel oil they will average down the cost of oil in the composite.

Experiments with Colloidal Fuel

Experiments in making colloidal fuel of combinations of fuel oil, coal and pressure-still residuals are being conducted at the Brooklyn plant of the Standard Oil Co. under the direction of the Submarine Defense Association, 141 Broadway, of which Lindon W. Bates is chairman of the engineering committee. Here the different blends and mixtures are tried out for efficiency and evaporative tests under the boilers of the power house, the same oil burning apparatus being used as for ordinary kinds of fuel oil.

A difference is noticed in the burning portion from that of the ordinary oil. Thousands of miniature flaming darts are thrown out from the burner and fall upon the bottom of the ash pit, where they continue to consume for several seconds. These are the specks of coal which give the fuel its colloidal characteristic. The regularity of this spray of sparks is taken to indicate how well diffused are the bits of carbon through the liquid.

Adjoining the boiler room in an open area 60 ft. square is the apparatus for making the colloidal fuel. It consists of a simple crusher for breaking up the coal in a dry state into a fineness sufficient for its passage through a 200 mesh screen. The fixateur is a heavy, black, pasty substance of the consistency of axle grease and is the apparently magic substance which holds the coal particles in suspension and which equalizes the different specific gravities that go into the mixture.

The fixateur, to the amount of 1 per cent of the finished product, is placed on the top screen of four horizontal screens which extend through the entire diameter of a tank, about 20 ft. high and 12 ft. diam. The oil is entered through the top of the tank and seeps through the fixateur. The lower screens catch that part of it which oozes through the first screen, thereby holding it up where more oil can encompass it. When the oil has thus been fixated, it is introduced by pumps into the mill, which is a cylindrical tank about 2 ft. high and 3 ft. in diam., inside of which are the mixers, consisting of arms with balls upon the ends. After the fixated oil and coal dust have been thoroughly compounded, the new mixture is pumped into storage tanks, ready to be forced into the burners.

Different grades of coal have been experimented with, ranging in ash content up to 25 per cent. An especially good carbon material has proved to be a coke, containing, it is stated, 98 per cent carbon, no ash and no sulphur. The mobile paste which is about half oil and half coal is said to develop the largest number of heat units per unit volume of any proportion. With higher coal percentage the total B.t.u. content per gallon diminishes gradually.

Though the first experiments were conducted for marine purposes during the submarine menace, it is believed that varied uses will be found on land as well as sea in many peacetime pursuits. It is thought that colloidal fuel will be the fourth major fuel, on a par with existing solid, liquid and gaseous burning substances. Experiments are soon to be conducted in steel plants. One advantage claimed is that waste coal will be utilized with profit by the new process. Instance is given of a Pittsburgh manufacturer, who now pays 15 cents a ton to have his powdered coal waste removed.

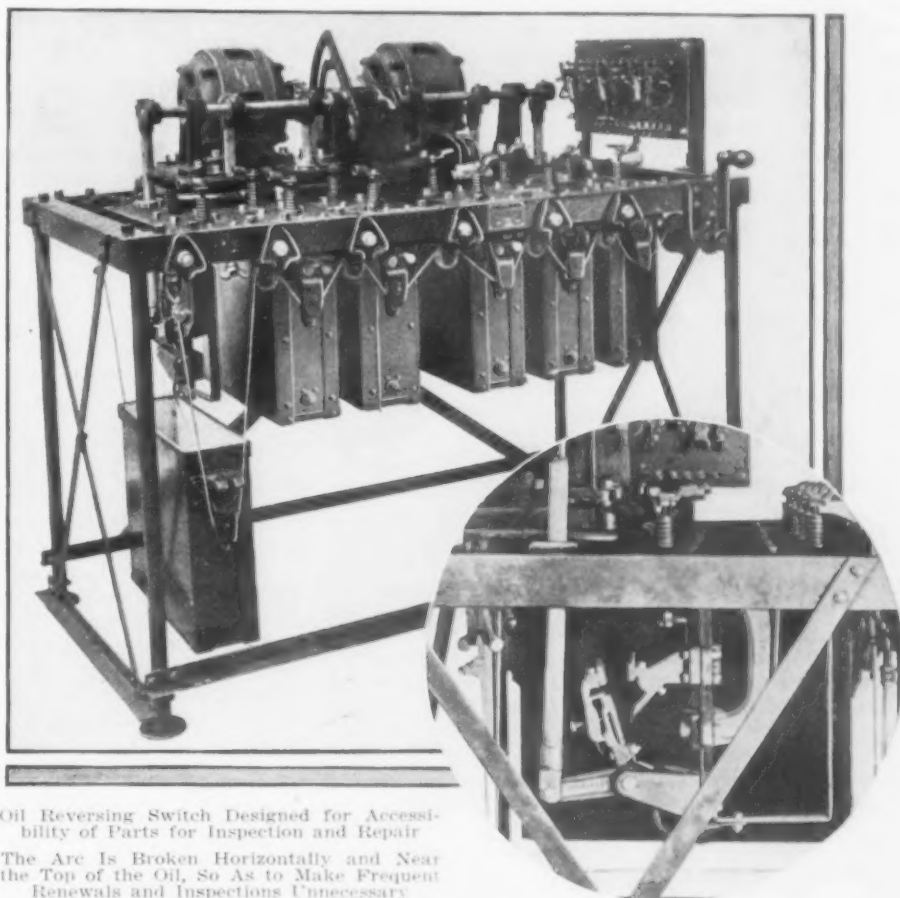
Oil-Reversing Switch for Large Motors

High-voltage slip ring motors built for steel mills, mine hoists and similar duty, require some form of switch to connect the primary winding to the lines, especially so when the motor is used for reversing service. The accompanying illustrations show a new primary oil reverse switch which consists principally of two 3-pole switch units each operated by a high torque motor.

Among the features of this switch are the unit tank construction and the means of lowering the tanks for inspection, repairs and renewal of oil. Unit tank construction is used because it increases accessibility and saves time and labor in locating trouble and making repairs. A double windlass with cables and pulleys permits easy lowering of one or more tanks.

In the end view one of the tanks is lowered to show the simple construction of the stationary and moving members. The arc is broken horizontally rather than vertically, thus allowing the arc to rise to the point of rupture without burning parts not designed for such duty; and since the rupture takes place near the top of the oil, it is well away from all sediment; frequent inspections and renewals are thus found unnecessary. In case of serious damage to any single pole unit the complete unit may be removed without disturbing any of the others.

The contactor panel shown at the extreme right is controlled from a master switch or push buttons, and handles the motor currents. Very little current is required, as the motors used have high resistance rotors. This particular reversing switch was made by the Cutler-Hammer Mfg. Co., Milwaukee, for a 1200-hp., 220-volt mine hoist motor. It may be used for two motors on non-reversing service, or where only one non-reversing motor is required, the switch is made with only one 3-pole unit and one switch-operating motor.



Oil Reversing Switch Designed for Accessibility of Parts for Inspection and Repair
The Arc Is Broken Horizontally and Near the Top of the Oil, So As to Make Frequent Renewals and Inspections Unnecessary

heat from the flue gases, the preheating of the combustion air results, it is claimed, in the production of a higher flame temperature, with an accompanying increase of efficiency within the furnace, and temperatures probably beyond 2000 deg. C. are readily attainable.

In heating mild steel billets up to a forging temperature of 1100 deg. the following results were obtained:

Heat	Weight of Charge, Lb.	Gas Per Lb., Cu. Ft.
1	1120	5.36
2	1080	1.63
3	1114	1.64
4	1114	3.60

The first heat was made in a dead cold furnace in frosty weather and with cold billets; the second immediately followed the first, and the third the second. The fourth, however, followed the third after the furnace had been shut down for a period equal to the ordinary

New Type of Gas-Heated Recuperative Furnace

A new form of gas-heated recuperative furnace, designed by the Davis Furnace Co., Luton, England, on what the company has named the "Revergren" principle, is stated to have given remarkable results under test, according to the engineering supplement of *London Times*. The company's aim was to reduce to a minimum the heat losses by way of the flue and to utilize for the purpose of the furnace the thermal energy thus recovered. To this end the designers place suitably proportioned double recuperators under the oven floor, and arrange that the heat-absorbing materials shall alternately be heated by the escaping products of combustion and made to give up their accumulated heat to the air that is passing into the combustion chamber. As a consequence of this arrangement it is stated that with an oven furnace $4\frac{1}{2}$ ft. by 3 ft., consuming 370 cu. ft. of city gas an hour and maintaining an oven temperature of 1050 deg. C., the flue gases have been found to have a temperature not exceeding 65 deg. C., thus containing only 2 to $2\frac{1}{2}$ per cent of the heat generated by the gas. Over and above the saving of

week-end cessation, this fact accounting for the increase in the gas consumption.

In another test which was supervised by an official of the British Ministry of Munitions, the conditions were that the furnace should be brought up to 820 deg., loaded with cold billets, and then brought back to the same temperature and maintained at it for one hour; the result was that the quantity of gas required to raise the charge to 820 deg. was 1.30 cu. ft. per lb. of billet, and to maintain the temperature at that point for an hour 0.341 cu. ft. per lb. Among operations that are not usually carried out in an oven furnace, the Revergren system is regarded as applicable to the heat treatment of refractory materials, for which extremely high temperatures are required; to the melting of non-volatile metals like iron and copper, and of glass in bulk in the open-hearth or tank type of furnace, and to pottery furnaces, where the long soft flames that extend through the furnace would enable the high temperatures required to be accurately maintained.

Charles C. Rand, formerly with the United Bureau of Standards, Pittsburgh, has accepted a position with the National Lamp Co., Cleveland, as research chemist, and will assume his new duties shortly.

LATIN-AMERICAN TRADE

Commercial Conference Will Probably Be Held —Meeting in Washington

WASHINGTON, March 25.—Plans to hold a Pan-American Commercial Conference in Washington in May or June are being considered by the directors of the Pan-American Union. So far, nothing definite has been determined, as the directors are sounding the interest that would be manifested in such a conference both in the United States and Latin America. If it is decided to hold such a convention, all of the big exporters of the United States, as well as the various Government officials in Washington and the diplomats of the Latin-American countries, would be invited to participate.

This announcement was made by John Barrett, Director-General of the Pan-American Union, at a conference of Washington officials held here last week at the invitation of the union. At the same time, Edward N. Hurley, chairman of the United States Shipping Board, announced that 22 12,000-ton passenger vessels of 16 knots are now being built for the South and Central American passenger service. Some of these ships have progressed so far that their interior fittings are being installed. No date, however, has been fixed for the beginning of this service.

"We intend to give excellent service to these Southern friends of ours, and the vessels that touch the ports below the Gulf of Mexico will be the best that can be constructed. Our motto must be to give an equivalent in return for service or trade, as the case may be, and we must not take the attitude of taking everything and giving nothing in return."

At the same conference—which was held in the Pan-American Union Building, Dr. L. S. Rowe, Assistant Secretary of the Treasury, and a member of the International High Commission, emphasized the necessity for closer financial relations with Latin America. He said the continual increasing stock of gold in the United States threatened undue inflation, and declared that we should pay greater attention to increasing South American investments as a means of extending our trade in that section of the globe.

"I hope that the War Finance Corporation may be able to help in this problem," he said, "by using at least a part of the \$1,000,000,000 placed at its disposal by Congress for the stimulation of our foreign trade. One method would be to use at least a part of this to permit the American manufacturers who will supply the street and steam railways of South America with equipment to bring the securities of their customers to the finance corporation and there secure the actual money advances required to make possible that business."

Governor W. P. G. Harding of the Federal Reserve Board also laid stress on the importance of more liberal financial relations with South America, and said the board was ready to encourage the establishment of branch banks by American national banks throughout the Southern hemisphere.

"Many of these countries," he said, "will be glad to patronize us if the financial arrangements can be made. They have the same situation we find in Belgium. It wanted to buy goods in the United States, particularly metals and cotton, but so far had been unable to pay cash. It is now arranging, however, with a syndicate of bankers in New York for a \$50,000,000 credit based on three months' acceptances to be renewed three times, thus giving a year's credit. These acceptances are guaranteed by 80 Belgian bankers. I cannot emphasize enough the necessity of assuming an attitude of financing our customers. If we want to do business we must extend credits with a liberal hand."

Burwe" S. Cutler, chief of the Bureau of Foreign and Domestic Commerce, declared that greatly extended passenger and freight service, adequate port and wharf facilities, the extension of liberal banking credits, and greater American investments in Central and South America were the chief prerequisites to proper commercial relations with those countries.

"The trouble with much of our banking relations with South America," he said, "has been the attitude of bankers, who felt that their duty ended with a mere speculation in exchange. They should perform services for their customers such as the British and German banks have done."

Dr. Julius Klein, Director of the Latin-American Division of the Department of Commerce, made a vigorous protest against the spread of what he called "wild cat" exporting to Latin America. He declared we must put our commercial relations with those countries on a more solid and permanent basis, and said that corporations wishing to do business there should assign at least 10 per cent of their annual product to South American trade.

Julius G. Lay, Foreign Trade Adviser of the State Department, announced the appointment of 15 economists as the membership of a new section on economic investigations. He also announced the addition of 25 men to the consular service. Director-General Barrett presided.

The Metal Trade in Hongkong

WASHINGTON, March 25.—Consul George E. Anderson at Hongkong, British China, has sent to the Bureau of Foreign and Domestic Commerce an interesting résumé of the metal trade in Hongkong during 1918. He goes into considerable detail on the changes in the iron and steel trade of the Orient. For the coming year he says the prospects for the metal trade are "not very satisfactory." He bases this belief on the fact that price adjustment seems particularly difficult in the Hongkong markets where it is expected that high prices will be maintained. He also cites the uncertainty of exchange as a demoralizing factor.

"The metal trade at Hongkong during 1918," says the report, "was the first to reflect changing war conditions; for a number of reasons the year's record was very unsatisfactory both to importers and to dealers, and trade to the outports in South China was worse than local trade. In a general way, the high prices, limited stocks, and difficulty of securing supplies, which characterized the trade in 1917, continued during the first half of 1918. With the more favorable war situation of the third quarter, there was a weakening of demand and unsettling of prices, and when the armistice was signed the market all but collapsed in the belief, on the part of Chinese buyers, that prices would drop very materially."

"In line with this feeling, local prices declined daily until in the latter part of December most lines of metals could be purchased more cheaply in Hongkong than in the United States, whence most of the supplies were received. After the signing of the armistice, orders for thousands of tons of metals of all sorts, purchased in the United States by Hongkong dealers for the trade in the Straits Settlements, India, Japan, Siam, Indo-China, and the East Indies generally, were canceled."

"During the year, the British and American Governments agreed that supplies of tin plate for the colony, one of the most extensive lines handled on the Hongkong market, should come only from Great Britain, the result being that, inasmuch as shipping from Europe was all but shut off, the colony received no supplies for some time. Several Hongkong industries, such as cigarette and biscuit factories and canning establishments, were very seriously embarrassed from time to time because of their inability to secure supplies necessary for their business. Later exports from the United States were allowed, but local prices, under the pressure of peace prospects, had so declined that they were below parity with prices in the United States, and the year closed with the market stagnant. Imports can now be had from both the United States and Great Britain, and prospects are that the trade will improve as soon as reasonably stable conditions are established."

Amplex, Inc., New York and Tokyo, announces that it will remove its New York office to the seventeenth floor of 6-8 West Thirty-second Street on April 1. This firm acts as representatives of American manufacturers in Japan and China.

Specifications for High Speed Steels

Requirements to Be Considered—Some European Steel Makers Discuss Physical and Chemical Characteristics and Methods of Testing

—BY R. POLIAKOFF*

IN working out specifications for delivery and acceptance of high speed steels quite a number of different questions have to be taken into consideration. Substantially they can be brought down to the following thirteen points:

1. Process by which the steel is to be made, Bessemer, open-hearth, crucible or electric. If any particular process of manufacturing is to be recommended, what ought to be the acceptance method in order to check the process?

2. Is any special length of bar required? Should it be of ordinary commercial length? Is it permissible to deliver short bars, and if not, then why?

3. Should the steel be delivered annealed or not annealed? Why?

4. What ought to be the requirements with regard to the length and cross section of the tools to be tested?

5. Should the tool be heat treated in accordance with the directions of the maker, or could a uniform method of heat treatment be adopted?

6. What is the value of testing the tools with a file? Can such a test be considered reliable?

7. Is it desirable to specify any chemical composition? If yes or no, then why?

8. Should the tools which are to be tested for acceptance purposes have a definite shape and what?

9. What ought to be the physical and chemical qualities of the bar on which the tools are to be tested?

10. Should the steel be tested for *speed* during a certain period of time, for instance 20 min., or for *time* at a certain speed? Give reasons.

11. What ought to be the depth of cut, feed and speed of the test?

12. Possible deviation in percentages of the weight of the lot or of the number of the bars to be accepted.

13. Is it desirable to establish any metallographic acceptance tests for the high speed steel to be delivered? If yes, what?

European Practice

Herewith are given summaries of what four leading European manufacturers of high speed steel think of the above thirteen points or questions. One of these manufacturers has works in Austria, the other three in Sheffield, England, one of these Sheffield manufacturers also having works in Russia. The opinions of the manufacturers are here given with the paragraphs, numbered to correspond to the number of the question discussed.

1. The manufacturers are in agreement that the high speed steel should be made exclusively either in the crucible or in the electric furnace. One manufacturer points out that the Bessemer and open-hearth processes are to be excluded from consideration, as, should the high speed steel be made by either of these two, the waste would be entirely too great and the loss in the expensive alloys or ingredients which are used in the manufacture would also be too great. Whether the steel be produced in the crucible or in the electric furnace rests with the manufacturer, this depending exclusively upon his equipment. From the above it follows that there is no necessity to introduce any specifications for the process of the manufacture of the steel; neither is it necessary to establish any specifications for a controlling test of the process by which the steel has been produced.

2. The Austrian manufacturer states that formerly he delivered high speed steel in bars from 6 to 10 ft.

long, but that shorter bars which occasionally turn out to be in the lot are not excluded from delivery. Generally speaking, he continues, the manufacturer has to have the right to deliver short bars to 1½ ft., otherwise the short bars would have to be considered as waste or scrap, and accordingly both the cost of production and the selling price of the steel would increase.

One Sheffield manufacturer gives the usual length of bars from 11 to 12 ft. He adds that one can deliver bars of any other length shorter than 12 ft. Another Sheffield maker gives the normal length of bars from 8 to 12 ft.

The manufacturer with works in both Russia and England is of the opinion that the length of the bar should not be specified, as this depends first of all on the section of the bars, and secondly upon the knowledge of the manufacturer to produce sound ingots. Some manufacturers experience difficulties in producing sound ingots 3 x 3 in., and their bars will therefore be considerably shorter than the bars of the manufacturer who has no difficulty in producing sound ingots 6 x 6 in. Further, some compositions of high speed steel can be rolled easily while it is very hard to roll others, which have to be forged; therefore, he concludes, rolled bars can have a length of from 18 to 25 ft. and forged ones only from 6 to 8 ft.

3. In regard to the question of delivering the steel annealed or not annealed, the manufacturers agree that where the steel is intended for tools of a more complicated shape, such as milling cutters, drills, etc., the steel should be delivered annealed, but that in the case of more simple tools, which are not subject before hardening to some complicated machining and which can be made by forging, as in the case of lathe tools, planer and slotting tools, steel can be delivered not annealed. One of the Sheffield manufacturers adds, however, that for steel which is to be used for making lathe and planer tools, annealing will be in place if the section of the bar is comparatively small, because if transported not annealed, the bar would easily break.

Form of Test Tools

4. The steel makers are generally in agreement as regards the requirements that the length and cross section of the tools to be tested should be made of the same shape and form as the tool which is to be used regularly and which is to be made from the steel to be delivered. The Austrian manufacturer takes exception to this, however. In his opinion the high speed steel should be given the form of a lathe tool as testing it in the form of other tools as drills, milling cutters, etc., takes much time, is expensive and because such testing cannot be conducted uniformly, it can give results of a casual character. The shape and size to be given to the lathe tool to be tested, he says, depends upon the construction of the machine on which the tests will be made, for instance, upon the size of the tool holder, etc. It would be natural to select such a shape and size as are normal for the given shop. He recommends that the lathe tool be made from square steel 1¼ x 1¼ in., or still better, 1½ x 1½ in., or from rectangular steel with an equivalent modulus of resistance. Steel of a size less than 1¼ x 1¼ in. is not recommended because in case the rest of the lathe cannot be brought near to the bar machined, the tool would chatter and likely break. It is difficult to make tools, he continues, having a section larger than 1½ x 1½ in. The length of the tools should be chosen so as to allow of reforging them several times; with the sizes of the section given above, 16 in. can be accepted as such a length. The preparation of the tool should

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go on naturally as follows: Separating of the piece from the bar, forging of the edge, preliminary grinding of the edge, hardening and final grinding.

5. It is the consensus of opinion that one should adhere strictly to the directions given by the manufacturer for the treatment of steel, because in many cases this treatment depends considerably upon the chemical composition.

6. Three of the manufacturers agree that the file test is either of little value or useless. The other, however, considers it of value. If a tool, he says, is to be used for machining hard materials, such as much worked tires, chilled iron, etc., a new smooth file should not "take" the hardened edge of the tool, provided the latter has been prepared properly in accordance with the directions of the maker and hardened in air, oil, tallow or train-oil. If the steel is intended for machining other than hard materials, it is not important if the file does "take" a little; but if the file "takes" the edge easily this means that the steel can be used only for machining wrought iron and very soft steel. As in every shop one has to machine not only such soft materials, but also harder ones, such kinds of high speed steels should not be used, generally speaking.

7. The answers all agree that it is impossible to establish any standards for the chemical composition of high speed steels. The maker has to be allowed absolute freedom in making his steel of such a composition as he himself considers the best, based on his specific knowledge.

8. All agree that it is better to maintain a uniform section $1\frac{1}{4} \times 1\frac{1}{4}$ in. for the lathe tools to be tested. Further discussion bearing on this point was given by one of the manufacturers in his reply to question 4.

Requirements of Test Tools

9. In discussing the requirements in regard to the bar on which the tools are to be tested, one Sheffield manufacturer gives a tensile strength of 45 to 53 tons per sq. in.; elongation 10 to 12 per cent in 2 in.; chemical composition, carbon 0.70 to 0.80 per cent., silicon 0.08 to 0.10 per cent, manganese 0.60 to 0.70 per cent. Another Sheffield maker specifies the use of open-hearth steel with carbon 0.55 to 0.65 per cent, silicon 0.10 to 0.25 per cent and manganese 0.60 to 0.80 per cent.

The Russian manufacturer states the bars should be annealed at a certain temperature during a certain period, and left to cool in the furnace after it has been forged to the required diameter.

Preliminary and Acceptance Tests

The Austrian manufacturer says that the tests should be conducted on hard forged steel having a tensile strength of not less than 40 tons per sq. in., preferably 46 tons per sq. in., the tensile strength should not be above 54 tons per sq. in., because if the steel is too hard there is more chance that the hardness will not be uniform and hence the results of the tests will not be truly comparative. If the steel has a tensile strength of less than 40 tons per sq. in., the results also are not always accurate because with such soft material a bad tool can still press out a chip even if it does not cut any more. Besides, a test on soft steel, if it is not made under a high cutting speed, takes too much time and requires the removal of a large quantity of material; because of this the various tools have to work on different places and parts of the metal machined, and the non-uniformity of the latter can influence some of the tools more than the other. The metal to be machined has in addition to be of sufficiently large dimensions, thoroughly forged under heavy presses (and not light hammers) and possibly be annealed.

This Austrian manufacturer, who before the war at least, was one of the largest and best known high speed steel makers in the world, distinguishes two kinds of tests with regard to high speed steels, namely, preliminary and acceptance tests. Preliminary tests, he states, are to be carried out for the purpose of finding which

of the different high speed steel brands is the best for the given particular shop as far as price, duration, etc., are concerned. The steel which turned out to be the best in the preliminary test is the one which has to be ordered and when it is delivered acceptance tests are to be made in order to ascertain that the steel delivered is identical with the brand that has been decided upon based on the preliminary tests. Although he does not insist on the tests being as strict for the preliminary as for the acceptance tests he states that preferably the same tests should be applied to both as laid down in the answers to the previous questions, also that it is desirable to make both the preliminary and acceptance tests on the same bar.

10. The Sheffield manufacturers are in agreement that the tests should run 20 min., as in their opinion a lesser duration would be too short and little convincing. One makes the test both with regard to speed and time, pointing out that both the cutting speed under a certain feed and depth of cut and the duration of cut of different tools on the same material under identical conditions of tests are important in reaching a conclusion as to the quality of the steel.

The Austrian distinguishes between preliminary and acceptance tests. He considers that the comparison of high speed steels in the preliminary tests has to be made based on time at a definite cutting speed, that is, each of the tools has to be tested under the same cutting speed and under other identical conditions until it fails; the duration of the run is to be considered as the result of the test. In the acceptance tests one has to proceed identically. If the tests are made on the basis of time, quite a number of preliminary tests would have to be made in order to arrive at the cutting speed which gives the prescribed duration of cut, and still when the proper tests will be made it could easily happen that the duration of run of the tool before failure will be longer or shorter.

11. The steel makers concur in that the depth of the cut should be $\frac{3}{16}$ in. and feed $\frac{1}{16}$ in. The Russian manufacturer points out that if a larger cut be taken the bar tested upon would be spent too soon. On the other hand, with depth of cut less than $\frac{3}{16}$ in., the error in measuring this depth, which can take place even with the best experimenters, would make too large a percentage from the total size and could therefore subsequently influence the accuracy of the results. He further points out that a feed less than $\frac{1}{16}$ in. is also not desirable because with a small feed every slightest fault near the cutting edge would be of great influence; also small, hard embedded spots or other faults in the metal which is tested upon, are of greater influence in case of a small feed than in case of a larger one. One maker gives the cutting speed as 40 ft. per min.

Important Test Factors

The Austrian manufacturer's opinion is that the cutting speed, feed and depth of cut depend also upon the capacity of the lathe on which the tests are to be made. For the preliminary tests, he says, the cutting speed should be chosen as high as possible in order that the best of the steels to be tested should last about 20 min. This speed is to be determined from a few preliminary tests. If the cutting speed is so small that the duration of cut turns out to be much longer than 20 min., then in case several tools have to be tested, this would take too much time; besides the differences in the working capacities of the different steels would not show up then sufficiently clear. With a cutting speed which gives the duration of cut much less than 20 min., the results of the tests can turn out to be too casual. Each tool has to be tested at least twice, that is, when freshly hardened and then reground. When making accurate tests, it is advisable to cut off the edge after the tool has been tested twice, and retest it at least once more. If this third test produces results which do not differ much from the results of the first two tests, further testing is unnecessary. The tests should not be conducted in such a way, that first one steel is fully tested, then the other one; first all the steels should be tested with tools made from them

freshly hardened, then all the tools have to be reground and tested a second time in the order of the first series. In this way one can avoid the non-uniformity of the metal machined affecting one brand of steel more than the other.

The tools from that brand of steel which turned out best in the preliminary tests and which has been decided upon to be ordered should be carefully preserved for the subsequent acceptance tests as standard tools.

It can happen that identical tools made from the same brand of steel will show differences with regard to output, due mainly to the differences in the meltings and casual circumstances which may take place during the tests. It should not therefore be required that the steel should give at the acceptance tests exactly the same results as at the preliminary tests.

For the acceptance tests the cutting speed should be taken 10 to 20 per cent lower compared with the speed which has been used in the preliminary tests or in the test with the standard tool, which gave a duration of 20 min. With the same sizes of feed and depth of cut, with the same shape of tool set under the same conditions with regard to the bar and the machining of the latter being done properly, the tool has to stand under the decreased speed an hour without getting blunt. In everything else one has to proceed in the same manner as in the preliminary tests.

If the duration of test turns out at the acceptance to be considerably less than 1 hr., one has to let the standard tools work under identical conditions in order to check whether perhaps the bar is harder at the places where it has been machined with the corresponding tools, compared with the places machined before. The same can be done, of course, also in case the duration of cut turns out to be higher than 1 hr.

In the acceptance tests it would be sufficient to test one tool for every 50 bars. If this tool does not give, after the three tests (first, with the edge freshly har-

dened and ground; second, reground, and third, with the edge freshly forged and hardened), in the average a corresponding output in comparison with the standard tool, one should repeat the tests with a tool made from another bar. If the second test turns out to be satisfactory, the lot is to be accepted. In the opposite case, it has to be rejected.

12. It is the consensus of opinion that the steel should be delivered in the exact number of bars ordered, but that the manufacturer has a right to make slight deviation, especially if the steel is ordered by weight. One maker specifies a deviation of 10 to 15 per cent.

13. All agree that it is not necessary for any metallographic tests. As one manufacturer points out, it would not be advisable as it would not give a proper idea about the working capacity of the steel; a correct idea of the quality and working capacity of a high speed steel can be gathered only through a practical test.

Qualities of Bar on Which Tools Are Tested

From the above it can be readily seen how important it is that the bar on which the tools should be tested should satisfy certain chemical and physical requirements. As a general recommendation, the author advocates a bar with a chemical composition having carbon, 0.55 to 0.65 per cent, silicon 0.01 to 0.25 per cent, manganese 0.60 to 0.80 per cent, sulphur less than 0.05 per cent, and phosphorus less than 0.05 per cent. The physical qualities after annealing should include a tensile strength of 40 to 42 tons per sq. in., and an elongation of 12 to 15 per cent in 2 in. The diameter of the bar should be from 6 to 12 in., and its length 5 to 8 times its diameter.

In addition the bar has naturally to satisfy also the other requirements, reference to which has been made above in the replies of the manufacturers.

CONTRACT CANCELLATIONS

Slow Rate Due to Need of Detailed Inventories and Need of Agreement

WASHINGTON, March 25.—Against a total of almost \$3,000,000,000 of recommended cancellations, the Ordnance Department is completing less than \$160,000,000 of contracts for ordnance material.

The statistics branch of the General Staff has completed an interesting study of the finances of the Ordnance Department with considerable detail as to the contract items which the War Department has decided should be completed instead of canceled. Because of the length of time necessary to collate the data from a long list of ordnance offices, the figures made public cover the situation only to Feb. 27. On that day the status of contract cancellations in the Ordnance Department was as follows:

Value of recommended cancellations.....	\$2,941,000,000
Value, actual cancellations, week ended Feb. 27....	568,124
Value, actual cancellations, total to Feb. 27....	185,132,068
Value of ordnance material to be completed after Feb. 27.....	158,648,576

"The slow rate of concluding formal cancellations," says the statement of the War Department, "is due to the need, in determining settlement claims, of detailed inventories, careful review of accounts, and agreement of contractor and Government agencies. Most of the balance on order has been suspended.

"The value of deliveries of certain important items for the week ended Feb. 27 was \$5,450,000 as compared with \$5,650,000 for the previous week, \$10,000,000 for the week before that, and \$26,000,000 for the week just before the armistice. Practically no artillery or trench warfare ammunition is now being loaded. Of 40 other important items, deliveries of 22 were at less than 50 per cent of the pre-armistice rate.

"Nearly \$12,000,000 worth of explosives have been

ordered transferred to the Department of the Interior for use in clearing land, road building, and so forth. Arrangements have been made for immediate disposal of 54 per cent of the surplus stock of 1,441,000,000 lb. of sodium nitrate, through transfer to the Department of Agriculture, sales of stocks in Chile through the British Pool, and sales through the United States Nitrate Board.

"The project for 194-mm. (7.64 in.) guns was abandoned even before the armistice, because of the impossibility of developing the required new capacity in time to be of use. Two gun forgings previously contracted for, however, were delivered by the American Bridge Co. early in December and sent to Watervliet Arsenal for machining. No carriages have been ordered. The recent newspaper notice that an order had been placed for a gun to supersede the famous 155-mm. gun seems to have been based on a misconception of the status of the work being done at Watervliet.

"On Sept. 16 the Artillery Board proposed the abandonment of the big Neville Island project which would have cost over \$150,000,000 and provided a plant surpassing in capacity the Krupp works in Germany, or the Creusot factories in France. The urgent demand in France for 14-in. guns required the concentration of all suitable labor, materials, machine tools, etc., on existing plants. The guns from Neville Island would not have been ready until 1920. Now that the signing of the armistice has led to a demand for retrenchment, the project has been completely abandoned. Actual expenditures to the signing of the armistice were over \$5,000,000, and outstanding obligations increase the figure to about \$12,000,000. Many of the special machine tools will be set up at Watervliet Arsenal, and other material will be sold to advantage or applied to other uses; for these reasons, the loss due to abandoning the project is much less than the total expended."

The statement also includes a detailed valuation by classes of items of the ordnance material to be completed after Feb. 27.

Air Operated Chucks

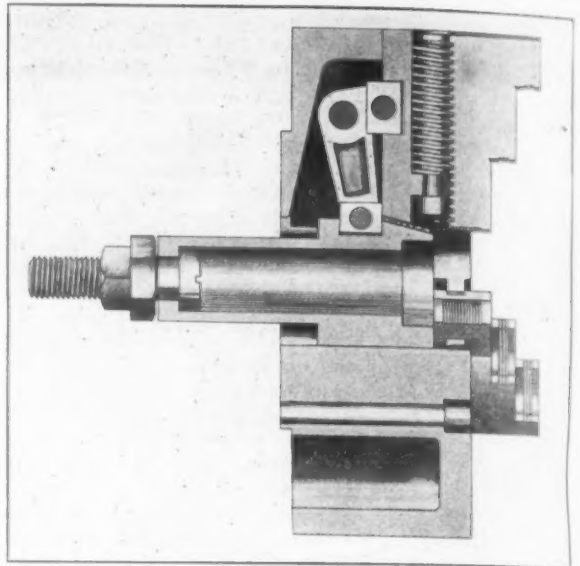
The Logansport Machine Co., designer and builder of air-operated, labor-saving devices, is now manufacturing a line of air-operated two and three-jaw combination and universal chucks, together with a double-acting air cylinder.

The air-operated three-jaw combination chuck has been designed to combine maximum power and minimum weight with simplicity of operation. By combining a number of parts in such manner as to get increased strength with a less number of working parts, the life of the chuck is prolonged, and it is made more serviceable for severe duty.

The body of the chuck is a one-piece casting, which eliminates parts and chattering when working under heavy cutting pressure.

In the jaw operating mechanism a special heat-treated lever is used, to which is pivoted hardened and ground steel blocks which engage in hardened and ground ways in both the draw tube and chuck jaw slide, and operates the jaws with a leverage of three to one, thus to insure a maximum of force applied in holding the work with a minimum of friction and wear in chucking work either externally or internally.

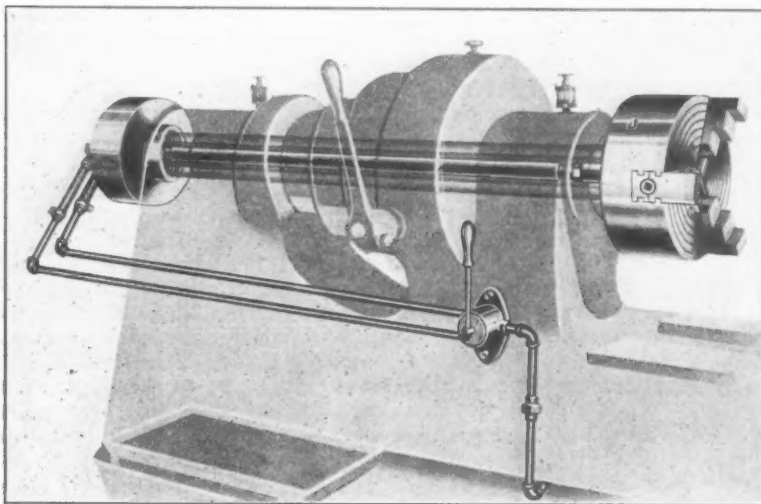
The taper on the draw tube and lower end of the chuck jaw slide move in relation to each other. As the draw tube is drawn back by action of the air cylinder, it advances the chuck jaw slide so that an equal distance between the chuck jaw slide and draw tube is



Sectional View of Logan Air Operated Three-Jaw Combination Chuck

without disconnecting the body. The valve can be located in any position on the machine.

The Frank G. Payson Co., 9 South Clinton Street, Chicago, is selling agent.



Logan Air Operated Three-Jaw Combination Chuck with Double Acting Air Cylinder Adapted to Turret Lathe

always maintained. To reduce friction and wear a piece of felt is inserted between the draw tube and chuck jaw slide, making a dust-proof joint and eliminating trouble caused from chips and dirt working into the operating mechanism of the chuck. Provision is made in the draw tube for inserting a bushing for supporting boring bars. The chucks are made in both two and three jaws in both combination and universal types, with 7, 9, 12, 15 and 18-in. outside diameter.

The air cylinders embody only the simplest mechanism. Liberal air channels are provided which insure speedy operation. Packings have been made accessible for quick adjustment and repacking. No parts are left extending to endanger the workmen. The design of the piston embodies the use of the Johns-Manville air cylinder packing cup and expander ring. The air shaft of the cylinder has been designed so that it can be repacked or adjusted without disconnecting the air hose connection. The air cylinders are regularly made with 3, 4½, 6, 8, 10, 12, 14 and 16-in. bore.

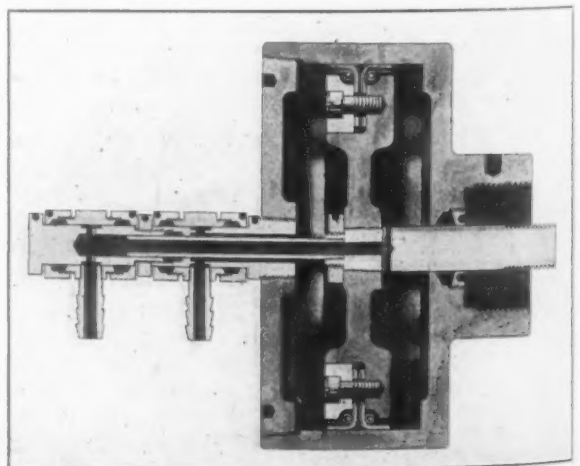
The air valve for operating the cylinder is designed to render efficient service at a minimum amount of upkeep and attention. The body is made from a semi-steel casting fitted with hand lapped bronze tapered plug, and is designed for direct piping to the cylinder without the use of elbows or other fittings. All internal parts are accessible for cleaning and oiling by the unscrewing of a cover permitting the removal of all parts

Vise for Woodworkers

A vise for pattern makers or woodworkers is announced by the Victor Tool Co., Waynesboro, Pa. Perpendicularly the vise can be set at any angle within a 90-deg. arc as well as being rotated and set at any desired point within the complete arc of another circle at right angles with the former circle. This can be done without loosening the work in the jaws. Wedge-shaped work will fit either end of the jaws as they are made to swing, pivoted in the center.

The vise is equipped with holding dogs suitable for grasping thin wood for surface working, and also has a pair of jaws for holding metal parts. Main jaws are provided with button-hole openings for the use of any shape or style wood pads for working soft wood. The jaws are smoothly finished for fine wood working.

Fire damaged the plant of the Nassau Steel Co., Manor, Pa., recently, causing a loss estimated at \$50,000. The Nassau Steel Co. was established at Manor about seven months ago to manufacture cold-rolled steel, and the first shipment was nearly completed.



Logan Double Acting Air Cylinder

War Labor Board Increasing Wages

In One Case, Minority Submits a Vigorous Protest—Supplemental Award in Case of Chicago Foundrymen's Association

WASHINGTON, March 25—There is no let up in the increases of wages ordered by the National War Labor Board. The newest grist of awards contains the usual quota of higher rates, although in one instance there was a vigorous protest by a minority of the board. It was rejected, however, by a vote of 6 to 4. This decision was on the question of awarding a 15 per cent increase to the workers in 27 textile mills in Pawtucket and nearby cities in Rhode Island.

The majority report ordered a 15 per cent increase in wages over the rates in effect July 1, 1918, and made the award retroactive to Oct. 11, 1918. The award is to be effective during the period of the war. The manufacturers are given the right to offer new testimony and to make a motion for a rehearing, but they must assume the burden of proof. Either side may ask the reopening of the case at the end of six months.

This report was supported by Joint Chairmen William Howard Taft and Basil M. Manly and by Adam Wilkinson, John J. Manning, Fred Hewitt and Matthew Woll. The minority report, signed by Granville E. Foss, H. O. Smith, Joseph W. Marsh and John F. Perkins, made a vigorous protest against the wage increase. As it may be again invoked in later cases, its line of reasoning is important.

The patternmakers employed by a long list of Buffalo firms were also ordered given a 15 per cent increase. But in this case there was no minority report. The companies involved are:

Acme Pattern Co., Buffalo Pattern Works, Black Rock Pattern Works, Bradley Pattern Works, Buffalo Forge Co., Lumen Bearing Co., F. A. Colson Pattern Works, J. P. Devine Co., Niagara Pattern Works, Otis Elevator Co., Pierce-Arrow Motor Car Co., Buffalo Car Wheel & Foundry Co., Niagara Radiator & Boiler Works, Standard Pattern Works, American Radiator Co., Snow Steam Pump Works.

The last two firms made no advance agreements to abide by the award, so it is announced only as a "finding" for their plants.

A supplemental award in the controversy between the Chicago Foundrymen's Association and the International Molders' Union of North America, orders the grant of a rate of \$6 per day to and continuing for the life of the original award.

In the case of the employees of the A. H. Petersen Mfg. Co., Milwaukee, Wis., the board ordered an 8-hr. day, with 72c. per hour for machinists and tool makers, 56c. for specialists and 49c. for machinists' helpers. The award is retroactive to Aug. 17, 1918, but provides:

"This award terminates as of Jan. 30, at the time the men went on strike, and is made applicable conditional upon the strike being promptly called off."

In the case of the Midwest Engine Co., Indianapolis, the board "recommends" that the wages paid to journeymen patternmakers shall be 80c. per hour, dating from Nov. 1, 1918, and continuing for the duration of the war.

In granting a series of increases in wages to the employees of the Wharton Steel Co. of Wharton, N. J., with an 8-hr. day for the furnaces, mines and quarries, except for a 9-hr. day for train crews, the board gave the first sign that war prosperity may have come to an end by including the following paragraph in the award:

"That in case of depression in business, necessitating the curtailing of production, the work to be done shall be distributed among the men working at the plant when such curtailing becomes necessary."

It also included the following paragraph of warning to the employees.

"CAUTION: All men who may be reinstated or re-employed by the company under this award should,

however, remember that they must be diligent and faithful in the performance of their duties, and obey the rules of the company, and that the right of the company to discharge men for just cause is in no sense abridged by this action of the National War Labor Board."

Strike Sentiment Prevails

In New England strike sentiment is still prevalent. Even in Lawrence, Mass., where the textile strike swung into action when employers were puzzling how to keep their employees at work, there is more than a possibility that the struggle will spread to other trades. The machinists' union in Lawrence announces that it has joined the campaign for a 44-hr. week on the ground that such a program will distribute the year's work more evenly.

Molders at Westfield, Mass., are reported as equally restless with other neighboring unions in planning for demands of increased wages.

Boiler makers on strike at Holyoke, Mass., are still marking time while they await what the State Board of Arbitration has to say on the public hearing held in the case of the strike at the Walsh plant. A report is expected soon, but to work while waiting would be more profitable for everybody concerned than the present idleness.

Approximately \$105,000 was paid out on March 18 in bonuses at the plants of the Springfield Armory. This is the second installment; a like payment was made last fall to workmen becoming automatically entitled to the amount because of long time service in the Government employ. Reports had been circulated that the bonuses would not be paid now that the war was over, but it is announced that those who have received the bonuses and are still employed at the armory will continue to receive \$10 monthly until July 1. The money comes from a fund established in 1918 by Congress. Many furloughed employees were paid bonuses last week.

Inquiries about the probability of the Government later on reimbursing the amounts that may be subscribed for maintaining branch offices of the U. S. Employment Service are not answered encouragingly, Congressman Treadway notifying the chairman of the Holyoke (Mass.) local board that considerable chances would be taken by any one guaranteeing the maintenance expenses. Some cities have undertaken to keep the offices in action through funds raised by voluntary contributions by the citizens. Others will be conducted by the State. Cities, as Meriden, Conn., offer quarters rent free, with light, heat and telephone.

Warner & Swasey Insure Employees

The Warner & Swasey Co., Cleveland, manufacturer of turret lathes, has insured all its employees who have been in its service six or more months, under the group insurance plan. Class A executives who have been with the company six months are insured for \$3000, and those in class B for \$1500 to \$2000, according to the length of their service within the range of six months to five and one-half years. All other employees, coming within class C, are insured for \$1,000 to \$1,500 according to the length of their service, also within the range of six months to five and one-half years. The insurance is absolutely free to the employees and it does not interfere in any way with the compensation act of Ohio.

Features of the 1919 annual banquet of the Pioneer Club of E. C. Atkins & Co., saw manufacturers, Indianapolis, were the presence of Harvey Avery of Travers City, Mich., who has been with the company for 30

years and who, although more than 80 years old, still represents the company as a traveling salesman; and the presence of Lieut. Wilmer J. Montgomery, recently returned from France, one of the heroes of the battle of Cantigny. The club is made up of employees who have been with the company 20 years or more. The 1919 officers are: Henry W. Larson, president; John Harrahan, vice-president; C. A. Newport, secretary, and Charles F. Aumann, treasurer.

Finding Jobs in Chicago

The Chicago Association of Commerce, in connection with the task of finding work for discharged soldiers and sailors, has begun an active campaign which will be participated in by all of its 54 committees covering various industries and branches of endeavor. B. S. Smith, chairman of the general employment committee of the association, in explaining the work, says:

"It is the purpose of the association to first endeavor to locate soldiers and sailors discharged from the army whose homes are in Chicago, and after that to locate civilians in employment whose homes are in Chicago, emphasizing that the soldiers and sailors discharged who come from other homes should return to their own home towns and connect up in the employments which they previously followed."

Letters containing requisition blanks will be sent to manufacturers in a few days, and it is requested that firms needing men fill in the blanks, regardless of the kind of men they need, whether they be laborers, skilled mechanics, or men in the professions.

Labor Notes

To provide positions for returning soldiers and sailors, the Sharon Steel Hoop Co., Sharon, Pa., has inaugurated an 8-hr. day in the open-hearth department instead of 10. Other departments also will cut the number of hours. It is probable that other steel plants in the Shenango Valley will introduce the 8-hr. day schedule.

The extension of the 8-hr. day at the Steelton, Pa., plant of the Bethlehem Steel Co. is contemplated. The matter is being left to a vote of the employees of the shops and mills, however, and votes recorded thus far are in favor of the basic 8-hr. day. The adoption of the 8-hr. schedule is designed, according to officials of the company, to give work to a greater number of men throughout the plant during the unsettled period in the steel business.

The basic 8-hr. day became effective in the plant of the Middletown Car Co., Middletown, Pa., producers of steel cars, on March 14. Three 8-hr. turns will go into operation largely in place of the two 10 and 11-hr. turns. The plan is designed to aid in affording employment to returning soldiers. More than 50 men who have seen domestic and foreign service have thus far been added to the company payroll.

The Mundorf Chain Works, York, Pa., has been closed by a strike for six weeks. A reduced wage scale is held to be responsible.

Last week Government workmen loaded into cars and shipped away shell material from the plant of the Metal Products Co., Beaver, Pa., which was recently seized by the Government, resulting in the closing of the plant. Several days ago Russell Thompson, secretary of the Metal Products Co., requested the Government to remove property. No immediate action was taken, but now the Government, still guarding the plant, has begun shipments. It is expected the removal of the Government material will permit the plant to resume work on peace-time contracts.

Some sections, notably at Bristol, Conn., are already looking forward and planning for that comfortable housing of their workmen that was so difficult to handle during the war-work turmoil and crowding. The latest realty company at Bristol includes representatives of the local manufacturers and a comprehensive home-building scheme involving \$1,000,000 investment is projected.

Harvester Employees Vote on Plan

The International Harvester Co., following the lead of several corporations throughout the country, has submitted to a secret ballot of its 30,000 employees in various plants—these comprising 17 in the United States and 3 in Canada—the question of adopting the Industrial Council plan. The elections were held March 12. The plan is somewhat similar to that adopted by the Inland Steel Co., Indiana Harbor, which was described in THE IRON AGE of Jan. 9, 1919. In or near Chicago, the company's plants are the Wisconsin Steel Co., South Deering, Plano Works, and West Pullman Works.

The purpose of the plan is to establish relations between employers and employees "upon a definite and durable basis of mutual understanding and confidence." The majority vote in each plant will decide whether the plan will be adopted at that plant.

The outstanding feature is the organization at each plant adopting the plan of a works council to consider and make recommendations to the management on all questions relating to working conditions, health, safety, recreation, education, hours of labor, wages, and similar matters of mutual interest.

The council will be made up of representatives elected by the employees and an equal number appointed by the management.

Manufacturers' Council of New Jersey

The next meeting of the Manufacturers' Council of the State of New Jersey will be held at Newark in April, with date to be announced later. At a recent meeting at the Robert Treat Hotel, Newark, Warren C. King, president King Chemical Co., Bound Brook, was re-elected president for the ensuing year; Colonel Austen Colgate, Colgate & Co., Jersey City, and George E. Hoffman, secretary of the Monument Pottery Co., Trenton, were re-elected first vice-president and secretary respectively; Kirk Brown, president Condensite Co. of America, Bloomfield, has been elected second vice-president, succeeding Dr. Henry C. Lovis, president Seabury & Johnson Co., East Orange; J. R. Monroe, president of the Monroe Calculating Machine Co., Orange, has been elected treasurer to succeed Arthur E. Barlow, secretary-treasurer of the Barlow Foundry, Inc., Newark, and T. S. K. Hawxhurst, Gulf Refining Co., Bayonne, has been elected assistant treasurer, succeeding Mr. Monroe in this office.

Commonwealth Steel Co.'s Safety Record

The following safety record for the year 1918 is announced by the Commonwealth Steel Co., St. Louis and Granite City, Ill.: Average number of men employed during the year, 2473; total number of days worked, 707,462; days lost, 25; number of compensation cases, 57; number of lost time cases, 124; in February, May and November, the report says, there was not a single compensation case. Against the 124 lost time cases of 1918, the report shows 371 lost time cases in 1917 and 769 lost time cases in 1916.

The company, before its Safety work developed expended \$2.16 on account of accidents for \$100 of payroll. After the development of the Safety and Fellowship Department, the company succeeded in reducing this expense to 12c. for \$100 of payroll in 1918.

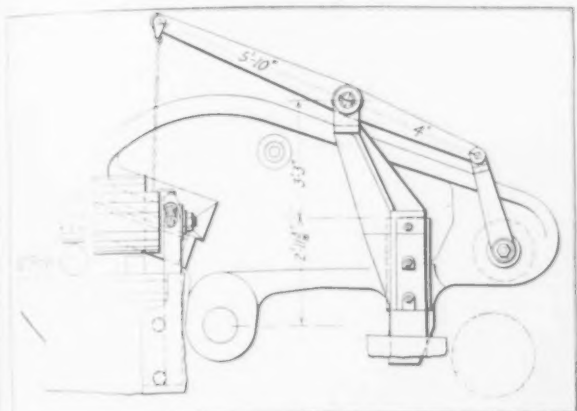
Mr. L. W. George is Supervisor of the Safety and Fellowship Department.

Farrell Works Improvements

YOUNGSTOWN, OHIO, March 25—Improvements aggregating \$500,000 have been started at the Farrell, Pa., works of the American Sheet & Tin Plate Co. Most important of the extensions will be a new and modern copperas plant to replace one destroyed by fire. It will be modernly equipped and will cost \$350,000. This plant will be used to convert into copperas the waste acids of the Mercer works, tinplate mill and the American Steel & Wire Co. works. The new building will be of steel. A new dining-room for employees is also to be built at a cost of \$85,000.

Holding Attachment for Shears

The device illustrated was designed by R. W. Smiley, chief draftsman Minnesota Steel Co., Duluth, Minn., for holding down scrap when being cut by an alligator shear. The upper lever of the shear had been broken owing to



Corrugated Cylindrical Cam Device for Holding Scrap to Be Sheared

the inability of the holding device used at that time to hold down properly all sizes of bars to be cut. This new holding attachment has been in use for the past two years doing good work protecting the shear and safeguarding the workmen. It consists of a corrugated cylindrical cam actuated by chain and lever and works in unison with the shear, traveling in advance of the shear blades so that the corrugated surface of the cam comes in contact with and holds firmly the piece before the shear blade strikes it.

The axis of the cam shown is horizontal, giving a space sufficient for any scrap necessary in this particular case. If, however, it is necessary to utilize the



The Corrugated Cylindrical Cam at the Side of the Shear Holds Down the Scrap When Being Cut

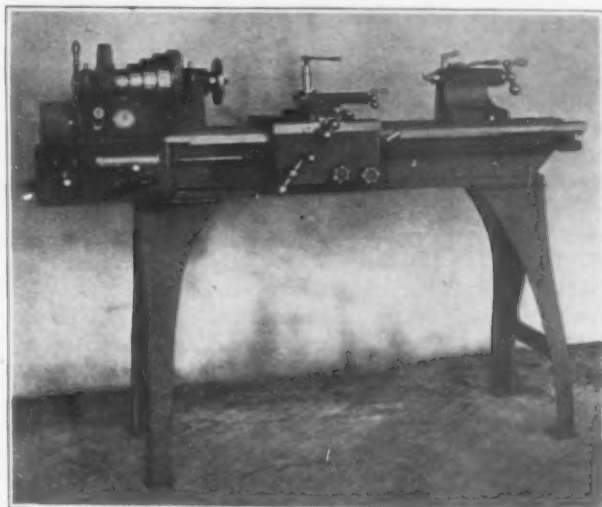
full opening of the shear jaws the axis of the cam may be inclined and the cam made eccentric.

This device is covered by patents.

The Worcester Pressed Steel Co., Worcester, Mass., has purchased additional land adjoining its factory and may erect a 14-in. Belgian train, 9-roll hot strip mill, electrically driven. Details not now fully determined.

Quick Change Engine Lathe

A new engine lathe with 11-in. swing, has been added to its line of lathes by the Seneca Falls Mfg. Co., Seneca Falls, New York. The machine has a quick change gear equipment, consisting of a train of nine gears in the form of a cone mounted on the lead screw, the whole being enclosed in the main gear box and controlled by one tumbler handle. By means of another tumbler carrying a set of compounding gears, the train of gears is given different speeds, thus providing 45 different changes of feeds and threads, from 3 to 96, including $11\frac{1}{2}$, none being duplicates. Any



An 11-In. Swing Engine Lathe with Quick Change Gear Equipment and Providing 45 Different Changes of Feeds and Threads

desired thread not given on the index plate may be obtained by using the necessary change gears on the feed stud. The drive is direct through a minimum number of gears from the head spindle to lead screw, which it is claimed absorbs practically no more power than a plain engine lathe.

The machine has a hollow spindle with 1-in. hole made from 60 to 65 carbon, crucible steel. The carriage is gibbed front and rear, and has power cross feed. The apron has a safety device so that opposing feeds, the long feed and split nut cannot be engaged at the same time.

James H. Grose, district superintendent of the Carnegie Steel Co., announces that the six blast furnaces in the Ohio works battery at Youngstown, will be overhauled and relined, commencing in April. He expects the work will require about 18 months. Mr. Grose states no pig iron is being piled except that necessary to carry the steel works over the period during which the furnaces are down.

It is reported that repairs on the Miami furnace of the Hamilton Iron & Steel Co., Hamilton, Ohio, will be completed in time to resume operations the first week in April. The furnace will blow in on basic iron.

The Boston offices of the Chicago Pneumatic Tool Co. have been removed to 182 High Street. F. S. Eggleson, district manager of sales, represents the company's interests in this territory.

The National Radiator Co., Johnstown, Pa., has rebuilt the core department of its plant, recently destroyed by fire, all necessary equipment having been bought and installed.

It is reported that M. Embiricos, of Athens, is forming a company with a capital of about \$6,000,000 for the erection of iron and steel works in Greece.

Reduction in Iron and Steel Prices

(Continued from page 815)

"It is expected that prices during 1919 will not be any lower, and our present intention is to make no decreases in wages except, perhaps, at some mills where there is a contract between employers and employees providing for a sliding scale.

"The price of iron ore f.o.b. Lake Erie ports remains unchanged, except where a reduction in freight rates would become effective, in which case the price of pig iron will be changed accordingly."

Friday morning the steel men left for New York. Everybody expected that the new schedule would be immediately made public. But it was not. Instead, Chairman Peek and William M. Ritter, the member of the board whose house guest Judge Gary had been, made a hurried call on Attorney General Palmer. They insisted that this was only a social call, but it is known that its purpose had been to reassure the conferees that there was no danger of subsequent prosecution under the anti-trust laws.

There was also a suggestion that the Railroad Administration was not satisfied with the rail prices fixed on Thursday. Whether they were finally convinced that they should accept the original price, or whether the steel men were induced by telephone to amend the schedule is not known. But the final statements of the prices did not come out until 4.40 o'clock Friday afternoon. Then it was made public as a part of the statement prepared in advance by Judge Gary as the representative of the steel men. This statement of Judge Gary follows:

Judge Gary's Statement

"After careful consideration and full discussion relating to cost of production, and all other facts and circumstances relating to the iron and steel industry, representatives of the industry submitted to the Industrial Board of the Department of Commerce a schedule of proposed reduced prices of the principal iron and steel products, which, with modifications suggested by the board and accepted by the industry, has been approved by the board.

"The objects to be secured are a revival and stabilization of business by establishing a reasonably low basis of prices which would be satisfactory to the consuming public, and yet, so far as practicable, would yield a moderate and reasonable return to the investors where they are entitled to it in the application of sound business principles; and at the same time would not disturb wage rates or interfere with wage agreements; and, further, having determined upon prices which it is expected will not be reduced during this year, it is believed that the volume of business will be promptly increased and that furnaces and mills will be operating at a largely increased capacity, thus giving employment to a correspondingly increased number of employees.

"It has been necessary to ascertain and scrutinize all the facts and figures in order to prevent any injustice, and this has been the occasion for considerable discussion and some differences; but as a final result of the conferences which have taken place during the last two days and before, the committee appointed to represent the entire iron and steel industries joined in the report which was made to the Industrial Board.

"While in the opinion of some of the manufacturers the board has insisted upon some changes in the schedule submitted before approving the same, yet the iron and steel committee is convinced that the members of the board have been governed solely by the intention of protecting and promoting the best interests of the public, the investors of capital, and the employees,

without discrimination, and that the action of the board has been wise and just.

"The iron and steel industry was the first called upon by the board to meet the business situation and to lend its energies and assistance in bringing about readjustment and restoration of the good business conditions, and therefore was the first called upon to make the necessary sacrifice in profits; but those connected with the trade believe that as a result for the year as a whole they will be compensated, and that if other lines of industry show the same disposition, as they undoubtedly will, we may expect great business progress and prosperity in the near future."

The Board's Statement

The following statement was issued at the same time by the Industrial Board of the Department of Commerce:

"In giving its approval to the schedule of prices just decided upon for the principal articles of iron and steel, the Industrial Board of the Department of Commerce, carrying out the purpose for which it was created, believes that a level has been reached below which the public should not expect to buy during the current year. The purpose of the board is to bring about such a lower level of prices as will effect stability and stimulate trade to the end that business and industry can proceed and build up with confidence and provide maximum employment.

"In its effort to effect co-operation between the Government representing the public, and capital and labor, it has in view a due and just regard for all of these interests and therefore in giving its approval to these prices and others which it will not consider immediately, it will endeavor to strike a balance which, while calling sooner or later for some sacrifice or adjustments on the part of all, yet will not subject any of these interests to undue hardship.

"The board is asking industry to co-operate in taking the first step and voluntarily make temporary sacrifices in the interest of all and has asked the iron and steel industry because of its fundamental importance, to be the first to act, and the board is highly gratified with the spirit in which it has responded.

"It is fully understood and expected that the present wage rates or agreements will not be interfered with, the approved prices having this in view.

"The reduction in the price lists may involve the necessity of some high-cost plants either shutting down temporarily or running at a loss for a period, but it is expected with an increased volume of business soon to be developed a reasonable return to the average and better than average producers will be afforded. In view of the higher costs developed throughout the world as a result of the war, a return to anything like pre-war prices is regarded as out of the question. It is expected that other industries as well as the consuming public and labor will recognize their obligations in the circumstances and co-operate in the same generous spirit as has the steel industry."

Those in Attendance

The representatives of the iron and steel industry at the meetings with the Industrial Board were the following:

E. H. Gary, United States Steel Corporation.
James A. Farrell, United States Steel Corporation.
John A. Topping, Republic Iron & Steel Co.
H. S. Snyder, Bethlehem Steel Corporation.
B. F. Jones, Jr., Jones & Laughlin Steel Co.
Leonard A. Peckitt, Empire Steel & Iron Co.
Price McKinney, McKinney Steel Co.
J. V. W. Reynders, American Tube & Stamping Co.
L. A. Block, Inland Steel Co.
J. A. Burden, Burden Iron Co.
W. U. Follansbee, Follansbee Bros. Co.
John A. Savage, John A. Savage & Co., also Lake Superior Iron Association.
C. H. McCullough, Lackawanna Steel Co.
John C. Neale, Midvale Steel & Ordnance Co.
F. H. Gordon, Lukens Steel Co.
James A. Bonner, United States Steel Corporation.
Charles M. Schwab, Bethlehem Steel Corporation.
E. G. Grace, Bethlehem Steel Corporation.

O. F. S.

WRECKING OF BELGIAN MILLS

Thorough Work Done by Germans at Many Steel Plants

LONDON, March 5.—In a recent letter readers of THE IRON AGE were given some particulars regarding the damage done to the Belgian and French blast furnaces by the Huns. Information is now available as to the position of certain of the Belgian steel works. There is not the least doubt that the damage was wanton and premeditated, and committed with the object of putting Belgium out of the world's markets after the war.

SAMBRE ET MOSELLE: The four Thomas converters here remain in good order, but the Martin furnaces have been entirely destroyed, and three of the 10 rolling mills have also been wiped out of existence. The entire electrical and mechanical plant has been wrecked, all the copper, bronze and brass having disappeared. Further, almost the entire fixed material and rolling stock, including 6 km. of railroad, 10 locomotives, cranes, 150 trucks, all the machine tools, ingot molds and small tools have been carried away. The damage at the plant is estimated at 7,000,000 to 8,000,000 francs.

THY LE CHATEAU: The works here have been almost completely demolished. Four blast furnaces and four Thomas converters have been dismantled, also six rolling mills.

HAINAUT: This plant has not suffered so severely as others, and its four converters, its two Martin furnaces and five rolling mills are intact, also its four blast furnaces.

MONCEAU ST. FIACRE: In addition to the three blast furnaces which have been put out of commission, the six rolling mills are also unworkable. On the other hand, the three Thomas converters have been spared and appear to be in workable order, but without blast furnaces and without rolling mills the converters are not much use. The rest of the plant has simply been sacked. The damage is put at 12,000,000 francs.

LA PROVIDENCE: One of the six blast furnaces can possibly be set going again within six months to a year, but the four converters have been so badly damaged that a long time will be required to restore them, and of the nine rolling mills, only four are capable of repair. Furthermore, at Marchiennes the central power station with its five motors has been stripped bare of the copper, the 12 steam boilers and the two blowing engines have either been removed bodily or smashed up, while at Dampremy the two blowing engines have been carried away, also the gas mains. From the coke works 10 steam boilers have been removed. At the steel works with its four converters, its mixers, machinery, 22 boilers and slag grinders, nothing is left but a motor, from which all essential parts have been removed. Nothing whatever is left of the rolling mills at Marchiennes, which contain four blooming trains driven by engines of 6,000 to 10,000 h.p. At Bellevue, however, the rolling mills can be started again when electrical power is provided. The estimate of the total damage done at the Providence works is more than 25,000,000 francs.

CHATELAIN: The three converters can be set going again, possibly by the beginning of July, but the two rolling mills cannot be repaired so rapidly as this, though they are capable of being repaired. The damage is estimated at from 1,000,000 to 2,000,000 francs.

CLABECQ: The plant has suffered severely; its three converters and six rolling mills being demolished. The damage is put at 15,000,000 to 17,000,000 francs.

G. BOEL: At these works it is said the Germans "excelled themselves" in the task of destruction. Of

the two blast furnaces, three steel converters, three Martin furnaces and 10 rolling mills nothing remains but heaps of scrap material. The damage is estimated at between 25,000,000 and 30,000,000 francs.

German Damage to Belgian Steel Plants

The correspondent of the London *Ironmonger* in Belgium makes the following report to his paper printed in its issue of Feb. 22, on the condition of certain Belgian steel plants.

At the Ougrée-Marihaye works two of the four Thomas furnaces of 49 tons each have been reduced to scrap. Eight of the 15 and nine of the 12 rolling mills, as well as 150 tons of copper cables for electrical purposes, 20 rolling transmission cranes, the bulk of the raw material, and all the small tools have been removed to Germany. If the works are provided with fuel and raw material they can promptly resume business in open-hearth steel, the three furnaces which were employed by the Germans being practically intact. Four of the eight blast furnaces can be repaired and two of them could be put in blast about the end of May next and supply 200 or 300 tons of iron daily.

At the Providence works four of the five blast furnaces are completely destroyed, the remaining one will be repaired, but it will take a year to get it ready. The boilers of the coke plant, which department was under reconstruction before the war, have been carried off. Of the open hearth steel plant, with four furnaces of 15 tons each, a single blowing engine is left. From the rolling plant, which had a normal monthly production of about 62,000 tons, the blooming and four other mills have been removed. The remaining two mills can produce nearly 10,000 tons monthly. The wire plant, with a normal monthly capacity of about 3000 tons can restart after repairs within two or three months. The Germans carried off about 56,500 tons of materials, representing a value of about 26 million francs.

The French branch of the Providence works at Hautmont, with a normal monthly production of nearly 10,000 tons, is completely despoiled, and the damage done here is estimated at 22 million francs. The Rehon plant, with three furnaces and a monthly capacity of about 18,000 tons, has also been almost completely demolished. The company, however, hopes to be able to repair one of the furnaces, and if the material carried off can be traced business here may be resumed in eight or nine months' time. The loss here is computed at 26 million francs. The requisitions from the company's stock-yard of Lille amount to 500,000 francs, so that the total loss of the Providence works is estimated at nearly 75 million francs.

The Central Iron & Metal Co. and the Chicago Rail & Equipment Co., Chicago, have consolidated and will operate as the Central Iron & Metal Co., with general offices and warehouse at Thirty-seventh and Rockwell streets, that city. Their plant runs from Thirty-sixth to Thirty-seventh streets and Rockwell Street through to Washtenaw Avenue. The company will continue to handle various sections new and relaying rail, accessories, equipment, machinery, etc. It has completed plans to enter the steel trade, and will carry a full line of steel products consisting of blooms, billets, slabs, ingots, and special steels to special analyses, hot and cold-rolled rounds, squares and flats, plates, sheets and shapes. Charles E. Nathan is the new officer elected as vice-president, also in charge of purchases.

Some 27,000 factories were destroyed in France according to Lieut. Raymond D'Aiguy in an address presented through the co-operation of the French American Chamber of Commerce and the Science Economique Section at the Bush Terminal Sales Building, New York, March 12. The speaker estimated also that 3000 miles of railroad track had been torn up and 1000 bridges destroyed and 50,000 railroad cars had been worn out or taken away by the Germans. He indicated that there would be a good deal of tariff protection except in the case of agricultural machinery, of which there is a lack of 300,000 machines of all kinds.

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The New Steel Prices

The new schedule of iron and steel prices announced at Washington after the conference of the Industrial Board and the committee of producers is plainly a compromise. For the most part it represents concessions by the manufacturers from the position most of them took before going to Washington. On the other hand, it does not make sweeping and disastrous reductions such as were called for by leading steel construction companies in New York, some of whom had said in print that nothing short of a two-cent basis for building steel would stimulate construction work.

The new prices are held to be minimum prices. All those named in the 15 months of regulation by the War Industries Board were maximum limits, sellers being welcome to quote below them if they desired; but in its official announcement last week the Industrial Board plainly referred to the new schedule as being in substance minimum prices, and for the remainder of this year. The iron and steel producers naturally take the same attitude, and it has even been intimated that reports that may circulate as to price concessions are to be viewed in the light of complaints and are therefore to be transmitted to the Industrial Board. One cannot say that the Sherman Law has been suspended, but it is said plainly that an understanding has been reached whereby the present operation will be regarded by the Department of Justice as not being in violation of that law. The position of the Industrial Board is now clearly established. The board is not seeking deflation of war-time prices by successive stages, but is seeking stability. It desired the producers to make the largest reductions feasible, but now that reductions have been made it does not expect, according to all the evidence, to seek additional reductions from time to time.

Needless to say, some producers will suffer more than others from the reductions agreed upon. There may be communities, dependent on the operation of small rolling mills, to which the new prices will bring hardship in the shutting down of plant. It is to be said of such cases that the same result would have come in an unregulated market, and for some mills even more quickly. So far as concerns inequalities in the schedule, the fact pointed out in some comments that pig iron is reduced 14 per cent as against only 5 per cent for tin plates,

7½ per cent of sheets, and 10 to 12 per cent for some other finished products—these are of much less consequence than that the industry as a whole has come to an agreement with agents of the Government on prices which in the judgment of both sides of the conference will result in better business both for steel works and for industries which have been waiting for the long-projected stabilizing of steel products.

It is interesting to compare the new schedule of prices with those which just preceded them, also with the first prices fixed by the War Industries Board in the latter part of 1917 and with the high peak prices of July, 1917. All are shown in the table below:

	Peak, July, 1917	First Govt. Price, 1917	Open Market, Jan. 1, 1919	New Agreed Prices
Pig iron, basic, gross ton.....	\$53.00	\$33.00	\$30.00	\$25.75
Billets, 4 in., gross ton.....	100.00	47.50	43.50	38.50
Steel bars, 100 lb.....	4.50	2.90	2.70	2.35
Structural shapes, 100 lb.....	4.50	3.00	2.80	2.45
Sheared tank plates, 100 lb...	9.00	3.25	3.00	2.65
Black sheets, No. 28, 100 lb..	10.00	5.00	4.70	4.35
Tin plate, 100-lb. box.....	12.00	7.75	7.35	7.00
Wire nails, keg.....	4.00	3.50	3.50	3.25
Rails, standard Bessemer, gross ton .....	.....	55.00*	55.00	45.00
Rails, standard open-hearth, gross ton .....	.....	57.00*	57.00	47.00

*Unregulated.

If complaint is made of the high percentage reduction in pig iron, it will be seen from the table that several products have now come down by a larger percentage than pig iron, from the top prices reached in July, 1917. While the percentage of reduction in pig iron is 51, for billets it is 62.5, for plates 70.6, for sheets 56.5. Approximately the new price basis is about 80 per cent above the 10-year pre-war average. On the other hand, wages in the industry to-day are from 120 to 150 per cent above the average in the same 10-year period.

So far as the building trades are concerned, quite disproportionate stress was put in the opinion quoted above on the necessity for a great reduction in steel. High labor costs are chiefly what holds back new construction. As between 2.35 cents for shapes and the 2-cent basis which the New York construction companies held to be necessary, the difference on a building taking 1000 tons of steel is \$7,000. A very considerable building can be put up with 1000 tons of steel and a \$7,000 difference in the steel for such a building is practically negli-

ble. Far more importance attaches to probable Government buying in the period the steel trade is now facing, than to any business the building trades are likely to place under present labor conditions. Unfortunately, little definite promise has come thus far from the Government beyond the assurance that 500,000 tons of rails for maintenance will be ordered at once. It is safe to say of buying in general that while the prediction of the Industrial Board as to the permanence of these adjusted prices is subject to the uncertainties that have surrounded steel market predictions in the past, the new prices will at any rate hold for some time to come, and a fair volume of buying of steel products during the next few weeks may reasonably be expected.

Continuance of High Prices

The question may well be raised whether so-called economists and others who are being widely quoted to the effect that prices are not going to fall are not overdoing the matter. Leaving out of the account the fact that price reductions in some lines have already been made, while the confident expectation of reductions in others exists, and is a market factor, much harm will come from widespread propaganda designed to make buyers in all lines satisfied with the indefinite continuance of war prices. To maintain war prices would mean that all the waste and inefficiency of manufacturing operations in war time must go on. It would mean not only that the high wages resulting from the powerful stimulation of war demand must be perpetuated, but that efforts to increase production beyond a rate notoriously under what was possible in pre-war time are to be resisted.

Those who consider it a virtue to preach that the public must accustom itself to war prices, and who urge the press to take up the preachment and iterate and reiterate it, apparently have unlimited faith in the possibility of having a thing believed and acted upon if only it be incessantly and insistently uttered. Some of those writers who took up the slogan "Buy now" have found themselves actually recording price reductions before the echoes of their vociferous urgings to others to do what they themselves would not do have had time to die out. The question of the right price, the price at which buying will be stimulated to the largest degree, is no simple one at any time, and to-day it is complicated as never before. What is well agreed is that a return to pre-war prices is not to be expected for a long time, and many considerations have been urged and accepted supporting the view that permanently higher prices have come because the war has produced human desires that will not be content with the old modicum of the satisfactions of life. But that does not mean that war conditions, either as to prices or output, must be maintained indefinitely. It has been an axiom in economics that the way to increase the use of an article is to cheapen its cost so that it can be marketed at a lower price. That is the road that must still be traveled if consumption is to be increased and the process of transfer from the luxury list to the necessity list continued as in recent years. The greatest triumphs of invention have been those which have

put within the reach of the average wage earner that which before had been available only to the few.

We make no reference here to specific industries or to specific schedules of prices, or to the stabilizing movement which has been brought forward under such good auspices to meet an unexampled emergency. We desire only to point out that the war has not abolished the fundamentals of industry and trade, and that there is danger in making a virtue of continuing high-priced production. Some manufacturers who, after several years of extraordinary profits have developed a hyper-sensitiveness on the subject of price changes, where their own product is involved, may find their arguments for the continuance of war prices coming back to plague them presently, when the business of getting back to economic production is taken up in earnest.

The Small Producer

The "small producer" has loomed large in discussions of iron and steel price readjustments, just as he did when the Government controlled prices as a war time measure. The circumstances, however, are somewhat different. It is always assumed, of course, that this small producer is a high cost producer. The small producers are quite content to let the matter go at that, for if such is not the case in individual instances the producer does not feel that he is injured by the misrepresentation.

The small producer, however, is in different circumstances now than during the war. For profits, two things are necessary—orders and profitable prices. Either one of the conditions by itself is not sufficient. During the war there was no question about the small producer receiving orders. All he needed was a profitable basis, the orders being readily available. Now the conditions are different. The producers, large and small, are not equally circumstanced as to the volume of business remaining on books, nor as to the volume of inquiry that may be expected when buyers are interested only in prompt deliveries. There have been references to "putting the small producer out of business", but the difficulty with some small producers is that they are already out of business, with their plants closed. What they desire is that circumstances be produced whereby they will have an opportunity to enter again. A market in which all purchases are for immediate delivery does not furnish the opportunity, since a mill must accumulate a batch of orders before it can venture to resume, and that involves a delay in filling the orders first taken.

Even the development of prices below his cost of production might be welcomed by the small producer with an idle plant, not because he would desire to sell at the moment, but because such prices might cause a buying movement which would result in forward buying and advancing prices, these being the conditions under which the small producer could force his way into the running again. The small producer may not feel that his case has been taken care of fully when prices are developed that would yield him a profit if he operated. He desires also that the necessary orders be forthcoming.

Fitting the Man to the Job

Not many years ago a New England shop superintendent was heard to remark to an applicant for a position that he cared nothing about what was done out of working hours if the employee was early and regular in being on hand. That superintendent, with his indifference to things he did not see, but that might have a very important influence on the progress of shop operations, was far from representing the employment standards now maintained at many plants.

One company goes so far as to say that promotion to positions of responsibility may be won only by citizens or those having declared their intention to become citizens and who are making definite progress toward real citizenship. The foremen are expected in that plant to live up to all that is meant by the title they bear; to be indeed leaders, and acknowledged as such, though in no sense drivers.

Foremen must know enough of the capabilities of their men to be able to guide them to further information, as by starting them in the local night school, and then to see that they get along well in what they have undertaken. To this end they should keep accurate records of the improvement activities of employees, which can be referred to when the management is planning to make promotions or assign new duties.

Not all employers go as far as this, but there is a very common and growing employment of record cards going into the industrial history of employees. There certainly should be as much on record concerning man power as is usually found in the inventory of machine equipment—more, in fact. Street addresses and telephone numbers are most useful in case of accident or illness, and personal data can be of important service in an inter-department way. That a lathe hand has had planer practice, that a toolmaker could sink a die and lap a thread gage, that a milling machine hand can wind an armature, or that a bench workman knows how to finish and gate metal patterns—such information has a direct bearing on a man's chances of promotion and when put in shape for emergency use becomes a direct asset of the concern.

A foundryman of wide experience found that recording "discounts," or spoiled work, to the individual debit of his molders brought a lively response from the men. When a molder came into the office to talk about an increase of his pay envelope, this foundryman would get out his cards. If the showing was good, the molder was told of it. If it was otherwise, then the facts were as tactfully as possible put before him. The average of the shop was also shown, so that the molder could make his own comparisons. Thus the interview often gave a helpful exchange of opinions and resolves for future performance.

Personal records are also of advantage in caring for misfits. Having the facts as to the shop training of the worker, the employment department, through the proper channels, may do one of two things: Train him to produce results where

he is, or arrange to put him where his training will enable him to produce results.

To repeat: A perpetual inventory of man power is as essential to effective shop operation as is the inventory record of machines and all other equipment.

Steel Castings and the War

The recent publication of Germany's steel output reveals the astonishing fact that in 1917 more steel castings were produced in that country than in the entire United States. The total German production in that year was 1,495,074 metric tons as compared with 1,441,407 gross tons in the United States. This comparison is all the more impressive when it is realized that Germany's total steel output was only a little more than one third that of the United States, or 16,500,000 tons against 45,060,000 tons in 1917.

How greatly the war accelerated the making of steel castings in Germany is shown by the fact that the pre-war output was only 363,000 tons out of a total of 18,950,000 tons in 1913 or about 2 per cent as against over 9 per cent in 1917 and 1918. This increased steel casting production was gradual, advancing from about 2 per cent of the total in 1913 and 1914 to 5 per cent in 1915, then to 7.5 per cent in 1916 and to 9 per cent in 1917 and 1918. Under peace conditions the steel castings output of Germany has averaged about 1.8 per cent of the total steel output whereas in the United States this ratio has averaged about 3 to 3.25 per cent. In fact the war made no difference in this country up to the end of 1917, the American steel castings output having been only 3.2 per cent of the total in our first year of the war. Meanwhile the British production of steel castings has likewise not been over 2 per cent of the total.

The principal effects of the war on the American steel casting industry, as judged by the 1917 data, were to increase the demand for acid open-hearth castings and to expand greatly the output of small castings. More acid than basic open-hearth castings were made in 1917. The weight of the acid output exceeding that of the basic by nearly 100,000 tons. This is the first time, with one exception, since 1911 that this has occurred, the difference in favor of acid having also appeared in 1915.

The extent to which the war has developed the American production of small castings is shown by the expansion in electric and converter castings. The electric output in 1917 was 64,911 gross tons or 4.5 per cent of the total as contrasted with 9207 tons in 1913 or less than 1 per cent of the total. Converter foundries in 1917 made 159,272 tons or 11.06 per cent of the total weight of castings produced as against 80,506 tons in 1913 or about 8 per cent of the total. The total open-hearth casting output was 84 per cent of the entire output of all steel foundries in 1917 but it was 89 per cent in 1913. The crucible casting output was only 3834 tons in 1917 as compared with 17,571 tons in 1913.

The phenomenal expansion in the German steel castings industry during the war is probably ex-

plained in part by the use of castings for tractors, tanks and artillery, both heavy and light, and in the not improbable extensive use of cast steel shells. Had the war lasted longer it is likely that there would have been a great exodus of tanks, artillery and other ordnance from America, swelling the steel castings output to much larger proportions.

Congressional Investigation of Price-Fixing Demanded

WASHINGTON, March 25.—Representative George M. Young of North Dakota, Republican member of the Ways and Means Committee, has demanded an investigation by the new Congress of the action of the Industrial Board of the Department of Commerce in fixing iron and steel prices by agreement with representatives of the industry. He charges that the prices were fixed without consultation with the consumers and that the producers are being given an immunity bath against the anti-trust laws by the co-operation of the Government officials. He says the prices were fixed so high that they will mean swollen prices for farm implements and therefore he thinks the House Committee on Agriculture should make the investigation.

Will Build Blast Furnace and Coke Plant at St. Louis

The St. Louis Coke & Chemical Co., St. Louis, which has purchased a 200-acre tract in Granite City, Ill., will erect a battery of 80 coke ovens of the Roberts type and a 550-ton blast furnace, work to start at once. The products will be basic and foundry pig iron and metallurgical coke. Cost of construction will be about \$6,000,000.

The National Enameling & Stamping Co., St. Louis, which is a heavy stockholder in the St. Louis Coke & Chemical Co., has an adjacent steel plant and has contracted to take the hot metal produced by the blast furnace. Since two large foundries are located at Granite City, the yearly local consuming capacity for pig iron is 300,000 tons. The St. Louis Coke & Chemical Co. expects to satisfy all of this demand eventually by furnishing pig iron in the form of hot metal.

The tract is located near two railroads and three belt lines, including the Illinois Central, the Chicago & Alton, and the Illinois Traction. The plant will start operations with one 550-ton stack, with proper lay-out having been made for the installation of an additional one when business warrants. Arthur Roberts, author of the type of coke oven employed, has produced a metallurgical coke from the Illinois coals which has been demonstrated to the satisfaction of the Coke & Chemical company and to others interested.

Officers of the St. Louis Coke & Chemical Co. are: President, Clem Studebaker; vice-president, George W. Niedringhaus; second vice-president and manager, L. E. Fisher; chairman of the board, Arthur Roberts; engineer in charge of construction, M. W. Ditto; manager of sales, W. G. McGuire.

Organization to Promote the Use of Electric Furnace Products

Important steps were taken to promote the use of various electric products at a meeting called by Acheson Smith, vice-president and general manager Acheson Graphite Co., held at Niagara Falls, N. Y., March 21 and 22. Mr. Smith made a general statement of the importance of getting before the consumers of electric furnace products and the public generally the great advantages of the use of electric furnaces. Special emphasis was laid on electric steel, the tonnage of which during the past four years has shown a remarkable increase

CONTENTS

Reclaiming High-Speed Steel Scrap.....	805
United States Government Will Sell French Rails.....	808
Stimulation of Coke Business Expected.....	808
Sound Steel Casting Does Away with Expensive Forging.....	809
American Tools in Australia.....	810
New Steel Works in France.....	811
British Iron and Steel Exports in January.....	811
Canadian Pig-Iron and Steel Output in 1918.....	811
Reductions in Iron and Steel Prices.....	814
Stokers to Burn Coke Breeze.....	816
The Testing Society's Meeting.....	817
Kentucky Fluorspar Mining.....	818
Change in Rail Specifications Proposed.....	819
Large Plate Mill for Japan.....	820
Conference of the Society of Industrial Engineers.....	821
Colloidal Fuel.....	824
Oil-Reversing Switch for Large Motors.....	825
New Type of Gas-Heated Recuperative Furnace.....	825
Latin-American Trade Conference in Washington.....	826
The Metal Trade in Hongkong.....	826
Specifications for High-Speed Steels.....	827
Inventories Delay Contract Cancellations.....	829
War Labor Board Increasing Wages.....	831
Harvester Employees Vote on Industrial Council Plan.....	832
Farrell Works Improvements.....	832
Quick Change Engine Lathe.....	833
Wrecking of Belgian Mills.....	835
Editorials:	
The New Steel Prices—Continuance of High Prices—	
The Small Producer—Fitting the Man to the Job—Steel	
Castings and the War.....	836-838
Congressional Investigation of Price-Fixing Demanded.....	839
Will Build Blast Furnace and Coke Plant at St. Louis.....	839
Selling Government Copper Stocks.....	839
Iron and Steel Markets.....	840
Prices Finished Iron and Steel, f.o.b. Pittsburgh.....	852
Metal Markets.....	853
Personal.....	854
Obituary.....	856
Machinery Markets and News of the Works.....	857
Current Metal Prices.....	866

not only in the United States but throughout the world. A splendid start was made to carry out these plans. The meeting was attended by representatives of a large number of companies representing manufacturers of electric furnace equipment, accessories, utilities, supplies, designers and inventors and manufacturers of electric steel.

A permanent organization, to be called the Electric Furnace Association, was created as follows: President, Acheson Smith, Acheson Graphite Co., Niagara Falls; first vice-president, C. H. Booth, Booth-Hall Co., Chicago; second vice-president, W. E. Moore, Pittsburgh Electric Furnace Co., Pittsburgh; secretary, C. G. Schluederberg, Westinghouse Electric Mfg. Co., Pittsburgh; and treasurer, F. J. Ryan, American Metallurgical Corporation, Philadelphia. The directors are the officers and C. A. Winder, General Electric Co., Schenectady, and F. J. Tone, Carborundum Co., Niagara Falls.

Important committees were created to begin work without further delay. It is likely that the next meeting will be held in New York the early part of April, at the same time as the spring meeting of the American Electrochemical Society.

Selling Government Copper Stocks

WASHINGTON, March 25.—The War Department tonight made public the agreement by which the United Metals Selling Co., representing American copper producers, will sell approximately 100,000,000 lb. of copper for the department as well as all the copper scrap to be disposed of by the Government. The department is to deliver at least 5,000,000 lb. monthly for 10 months and then 10,000,000 lb. monthly for five months. Each company will receive an amount of copper equivalent to at least 10 per cent of its total sales. In the event of a good market, the Government will increase the amount delivered. The copper will be disposed of at market prices and the companies will be allowed a small commission for handling.

Iron and Steel Markets

MODERATE BUYING IN SIGHT

Reduced Prices Will Release Accumulated Orders

Extent of Government Buying Problematical—Steel Works Operations Reduced

The opinion is general in the steel trade that the reduced prices announced by the Industrial Board at Washington on March 20 will bring out in the near future a moderate amount of new business, most of which buyers have held up since the stabilizing movement loomed up six weeks ago. The reductions range from \$4.25 per ton on pig iron and \$5 on billets to \$10 on standard rails, and amount to \$7 per net ton on plates, shapes, bars, wrought pipe, sheets and tin plate and to \$5 on wire, wire nails, hoops and light rails. Eastern bar iron makers have met the reduction on steel bars, dropping their price from 2.90c. to 2.35c., Pittsburgh.

Willingness to co-operate with the Government to secure a stable market and the largest possible operation of iron and steel works is shown both by producers and manufacturing consumers. It is yet to be developed how far the reductions will go in stimulating a demand over and above what has accumulated and whether the new prices can be maintained as minimum through the year as proposed in the Washington program.

The chance of political interference with the new movement has been in the minds of some leaders in the trade. Already a threat of the Sherman act and of a Congressional investigation has appeared on the horizon.

It is agreed that much depends on the amount of Government buying in the next three months. Early rail orders for 500,000 tons for maintenance are expected from the Railroad Administration, but the decision as to any purchasing program of real significance is left with the individual roads. While there is some talk of car and locomotive needs, their extent is thus far problematical.

Operations at steel works have fallen off in the past week. The Steel Corporation's Chicago district plants, which ran exceptionally well in February, are now on an 80 per cent basis. In general independent steel companies are averaging 60 per cent. At Cleveland a large open-hearth steel plant closed down last week.

Most of the activities of selling offices in the past few days have had to do with price readjustments. On finished material, except where it was bought for ships, bridges or other definite contract work, deliveries after March 21 will be at the new prices.

The pig iron trade is in confusion over the reduction of \$4.25. Contrary to long-established practice in that trade, contracts were revised to the De-

cember basis of \$30, but in some cases with the proviso that that reduction was final. One producer at least has announced this week that the new price will apply to all future shipments. A meeting of Central Western producers at Pittsburgh to-day (Wednesday) will decide some problems as to basing, differentials, etc.

Cleveland district blast furnaces have already decided to sell their iron on a Valley basing, making the price of No. 2 foundry iron \$28.15, delivered.

A strange feature of the Washington announcement is that if iron ore for 1919 is lowered there shall be a further reduction in pig iron. Yet more furnaces are going out because \$25.75, the new price, is below their cost.

Various prices dependent on those already named are being reduced. Thus bolt, nut and rivet makers will name their prices Thursday. Cast iron pipe has been lowered \$5 a ton. Warehouse prices in finished products now carry \$15 per net ton advance over mill prices instead of \$20.

Among the few Government projects on which early purchasing is regarded as likely are some six floating drydocks for the Emergency Fleet Corporation, each taking 2000 tons of plates and shapes. Among private fabricated steel ventures is a publication building in New York, involving 3000 tons and under active negotiation. The Standard Oil Co. has yet to place 5200 tons of tank work, following the buying of 8000 tons last week.

New blast furnace capacity for St. Louis appears now to be definitely decided. The National Enameling & Stamping Co. is to utilize hot metal and an outlet for the 550-ton stack proposed is also afforded in the large casting interests centered at Granite City, Ill.

London advices are that steel makers have applied to the Ministry of Munitions for permission to increase their prices, owing to growing costs. Plans are maturing there for a central tin plate selling agency in view of American tin plate competition. The Lorain Steel Co. has sold 1000 tons of girder rails to the Birmingham Corporation at £16 15s. The reported sale of 10,000 tons of American tin plate bars in Great Britain is not definitely confirmed.

Pittsburgh

PITTSBURGH, March 25—(By Wire).

The feeling prevails that the reductions made in Washington last week in iron and steel prices will bring out in the very near future a moderate amount of new business, most of which was held up by buyers pending the announcement of the new prices, but whether the buying trade is ready to accept the statement that the new prices are minimum and will prevail over the remainder of this year is a question that time alone will answer. There is no doubt that there is a much more cheerful feeling in the trade, and the belief is strong that business will be much larger during the second quarter at least than in the first. It is a fact that a good many buyers expected

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 25, 1919	Mar. 18, 1919	Feb. 25, 1919	Mar. 27, 1918
No. 2 X, Philadelphia...	\$31.90	\$33.35	\$36.15	\$34.25
No. 2, Valley furnace...	26.75	28.00	31.00	33.00
No. 2, Southern Cin'ti...	30.35	34.60	34.60	35.90
No. 2, Birmingham, Ala.†	26.75	29.00	31.00	33.00
No. 2, furnace, Chicago*	26.75	31.00	31.00	33.00
Basic, del'd, eastern Pa.	29.65	33.90	33.90	33.75
Basic, Valley furnace...	25.75	30.00	30.00	33.00
Bessemer, Pittsburgh...	29.35	33.60	33.60	37.25
Malleable, Chicago*	27.25	31.50	31.50	33.50
Malleable, Valley...	27.25	31.50	31.50	33.50
Gray forge, Pittsburgh...	27.15	31.40	31.40	32.75
L. S. charcoal, Chicago...	38.85	38.85	38.85	37.50

Billets, etc., Per Gross Ton:	Mar. 25, 1919	Mar. 18, 1919	Feb. 25, 1919	Mar. 27, 1918
Bess. rails, heavy, at mill.	\$45.00	\$55.00	\$55.00	\$55.00
O. h. rails, heavy, at mill.	47.00	57.00	57.00	57.00
Bess. billets, Pittsburgh...	33.50	43.50	43.50	47.50
O. h. billets, Pittsburgh...	33.50	43.50	43.50	47.50
O. h. sheet bars, P'gh...	42.00	47.00	47.00	51.00
Forging billets, base, P'gh.	51.00	56.00	56.00	60.00
O. h. billets, Philadelphia...	42.50	47.50	47.50	50.50
Wire rods, Pittsburgh...	52.00	57.00	57.00	57.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Common iron bars, Phila...	2.595	3.145	3.145	3.685
Common iron bars, P'gh...	2.90	2.90	2.90	3.50
Common iron bars, Ch'go.	2.62	2.92	2.92	3.50
Steel bars, Pittsburgh...	2.35	2.70	2.70	2.90
Steel bars, New York...	2.62	2.97	2.97	3.095
Tank plates, Pittsburgh...	2.65	3.00	3.00	3.25
Tank plates, New York...	2.92	3.17	3.27	3.445
Beams, etc., Pittsburgh...	2.45	2.80	2.80	3.00
Beams, etc., New York...	2.72	3.07	3.07	3.195
Skelp, grooved steel, P'gh.	2.45	2.70	2.70	2.90
Skelp, sheared steel, P'gh.	2.65	3.00	3.00	3.25
Steel hoops, Pittsburgh...	3.25	3.30	3.30	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Mar. 25, 1919	Mar. 18, 1919	Feb. 25, 1919	Mar. 27, 1918
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	4.55	4.70	4.70	5.00
Sheets, galv., No. 28, P'gh.	5.70	6.05	6.05	6.25
Wire nails, Pittsburgh...	3.25	3.50	3.50	3.50
Cut nails, Pittsburgh...	5.00	5.00	5.00	4.00
Fence wire, base, P'gh...	3.00	3.25	3.25	3.25
Barbed wire, galv., P'gh...	4.10	4.35	4.35	4.35

Old Material,

Per Gross Ton:	Mar. 25, 1919	Mar. 18, 1919	Feb. 25, 1919	Mar. 27, 1918
Carwheels, Chicago...	\$21.00	\$21.00	\$21.00	\$30.00
Carwheels, Philadelphia...	23.00	23.00	23.00	30.00
Heavy steel scrap, P'gh...	14.00	14.00	14.00	30.00
Heavy steel scrap, Phila...	15.00	14.00	14.00	29.00
Heavy steel scrap, Ch'go.	16.00	15.50	14.50	29.50
No. 1 cast, Pittsburgh...	18.00	18.00	18.00	30.00
No. 1 cast, Philadelphia...	22.00	21.00	23.00	30.00
No. 1 cast, Ch'go (net ton)	22.00	22.00	20.50	27.50
No. 1 RR. wrot, Phila...	21.00	20.00	20.00	35.00
No. 1 RR. wrot, Ch'go (net)	16.00	15.50	14.50	30.75

Coke, Connellsville,

Per Net Ton at Oven:	Mar. 25, 1919	Mar. 18, 1919	Feb. 25, 1919	Mar. 27, 1918
Furnace coke, prompt...	\$4.00	\$4.00	\$4.25	\$6.00
Furnace coke, future...	4.25	4.25	6.00	6.00
Foundry coke, prompt...	4.75	5.00	5.00	7.00
Foundry coke, future...	5.50	5.50	7.00	7.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	15.12 1/2	15.00	16.25	23.50
Electrolytic copper, N. Y.	15.37 1/2	14.75	15.50	23.50
Spelter, St. Louis...	6.17 1/2	6.12 1/2	6.25	7.25
Spelter, New York...	6.52 1/2	6.47 1/2	6.60	7.50
Lead, St. Louis...	4.95	5.00	5.00	7.10
Lead, New York...	5.20	5.25	5.25	7.25
Tin, New York...	72.50	72.50	72.50	85.00
Antimony (Asiatic), N. Y.	6.25	6.75	7.12 1/2	13.25
Tin plate, 100-lb. box, P'gh	\$7.00	\$7.35	\$7.35	\$7.75

a larger reduction in prices than was made, having in mind the pre-war prices and also the possibility that labor would be asked to accept a reduction. It should be borne in mind that the new schedule does not stand in the same light as the prices that were fixed by the Government through the War Industries Board during the war period. The prices sent out from Washington last week are simply those suggested by the Government as a basis on which to do business and to stabilize the market. The Government has committed itself to make purchases at these prices, and has suggested to general consumers that they should do the same, first, to start business going and, second, to permit stabilization in prices, such as existed during the war period. There was some sentiment expressed at the meeting in Washington last week in favor of a more radical cut in prices, and also to ask labor to stand a material reduction in wages, but this was not carried out. It is understood Government officials and also the heads of several larger steel companies that have low costs do not favor any concerted effort to reduce labor while the present high cost of living obtains.

Steel producers confidently expect receipt of larger orders for their products than they have had for some time, and already inquiry for sheets, tin plate and other finished steel is said to be better. Sentiment in the scrap trade has improved, and dealers look for a better market in the near future. The steel trade as a whole has rallied to the support of the Government in its efforts to stabilize steel prices, just as it did when the war demand came on us, and it is the strong hope of every one in the trade that the two objects to be desired will be realized, i.e., stabilization in prices and the starting up of the steel business which, so far as new buying is concerned, has been practically dormant since shortly after the armistice was signed.

Pig Iron.—A meeting of the Western Pig Iron Asso-

ciation was held in Cleveland last week, but the attendance was not representative and no action of importance was taken. However, as a result of this meeting a meeting of the Associated Manufacturers of Merchant Pig Iron, which association, embracing nearly every blast furnace in the district, is to be held in the William Penn Hotel, in this city, on Wednesday, March 26. H. G. Dalton, of Cleveland, president of the association, will not be able to be at the meeting, and C. D. Dyer, of the Shenango Furnace Co., who is vice-president, will likely preside. At this meeting the reduction in prices of pig iron made in Washington last week will be fully discussed, and other matters of vital interest to the members. It is pretty generally conceded that on the new prices of pig iron few of the merchant furnaces can operate and already a number of stacks are getting ready to go out of blast as soon as present ore is worked up. Some of the merchant furnaces say their cost of making basic iron, on last year's ore prices, and also on \$4.50 coke, ranges from \$27 to \$28 per ton and their only course is to close down. It should be borne in mind that prices on pig iron as adopted at Washington last week will not be minimum over the entire year. It has been stated that a reduction in Lake carrying rates from \$1.10 to 80c. per ton on ore from upper Lake docks to lower Lake ports may be made, and probably would be followed by a reduction in prices of ore. Whatever reductions may be made in ore prices and carrying rates are to be reflected in a corresponding reduction in pig iron prices. In fact, pig iron is the only material on which it was officially stated lower prices would be made, if ore and carrying rates were reduced. Some furnaces have figured out that paying \$6 for coke on a price of \$33 for basic iron, they are now entitled to coke at \$4.68 per net ton at oven, based on \$25.75 for basic at Valley furnace. It is also a question whether the differential of \$2.20 in favor of Bessemer over basic will be maintained. In fact, one or two large producers of Bessemer iron have stated that if some attractive business

were offered to them they would be inclined to accept it at probably not over \$1 advance in the price of basic. The different basing points for pig iron really do not cut any figure any longer. The Birmingham basis is the same as the Valley basis, and it is patent to every one that none of the Birmingham furnaces could sell iron in the Pittsburgh district in competition with Valley furnaces, unless they would agree to absorb the difference in freights, which is not likely. In the meantime, there is no new inquiry for pig iron, but it is said several small lots of basic, probably 1500 tons in all, that were negotiated for before the Washington prices were given out, have been closed up at the present price of \$25.75 Valley for basic. Prices in effect since March 21 on pig iron are as follows:

Basic pig iron, \$25.75; Bessemer, \$27.95; gray forge, \$25.75; No. 2 foundry, \$26.75; No. 3 foundry, \$26.25; and malleable, \$27.25; all per gross ton at Valley furnaces, the freight rate for delivery in the Cleveland and Pittsburgh districts being \$1.40 per ton.

Ferroalloys.—The inquiry for ferroalloys of all kinds is very quiet and consumers are reported to have on hand stocks large enough to meet their entire needs, and more, over the remainder of this year. Any sales of ferroalloys being made are of resale material which goes at lower prices than are named by the manufacturers. A Youngstown steel interest is reported to have bought about 50 tons of 80 per cent ferromanganese at about \$130 delivered. Resale 50 per cent ferrosilicon has been offered as low as \$90 per gross ton delivered. We quote 80 per cent ferromanganese at \$130 to \$135, with a reduction of possibly \$3 per unit, on lower percentages. We quote 16 to 18 per cent spiegeleisen at \$42 to \$43, \$3.50 per unit being added or deducted when the manganese content is above or below the standard. We quote resale 50 per cent ferrosilicon at \$90 to \$100 per gross ton delivered. Prices on Bessemer ferrosilicon and silvery iron are purely nominal.

Billets and Sheet Bars.—A straight reduction of \$5 per ton has been made in prices of 2-in. and 4-in. billets, also on sheet bars and slabs, effective from March 21. As to whether the lower prices will stimulate demand for semi-finished steel depends entirely on whether the sheet and tin plates and finishing mills are able to obtain more business than they have had for some time past. In the last few days new inquiry for sheets and tin plate has been better, and this leads to the belief that probably the demand for sheet bars may be heavier in the near future.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$38.50, 2 x 2 in. billets at \$42; sheet bars, \$42; slabs, \$41. and forging billets \$51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Plates.—Prices on plates have been reduced \$7 per ton, or from 3c. to 2.65c. at mill, effective from March 21. Plate manufacturers believe this lower price will bring out a large amount of business that has been held up by consumers awaiting the lower price. The new demand for plate is dull and some mills are not operating to more than 50 per cent of normal capacity, and a few at a lower rate. The McClintic-Marshall Co. has taken an order from the Standard Oil Co. for oil tanks requiring about 8000 tons of plate, which have been placed with a local mill. Bids for this tonnage were originally opened on Feb. 18 last, but no award was made, as the Government was waiting for the lower prices on plates, negotiations for which were under way at that time. As yet, no new orders for steel cars are in sight, but it is said the Government may come in the market before long for both freight and passenger cars, for which a large tonnage of plates will be needed. We now quote ¼ in. and heavier sheared plates at 2.65c. at mill.

Structural Material.—Prices on beams and channels up to 15 in. have been reduced \$7 per ton, the new price being 2.45c. at mill, Pittsburgh, same extras and differentials as before. Practically no new work is in sight and local fabricators say the amount of new business they are entering is very small, being mostly repair work for railroads, for which the amount of material needed is not large. We now quote beams and channels up to 15 in. at 2.45c. at mill, Pittsburgh.

We quote beams and channels up to 15 in. at 2.45c. at mill, Pittsburgh.

Iron and Steel Bars.—Prices on steel bars were reduced \$7 per net ton and these are now quoted at 2.35c. mill, Pittsburgh, on bars rolled from billets. As yet, manufacturers of bar iron have not established new prices to conform to the lower prices on steel bars, but will likely do so this week. The demand for steel bars has been very light, but mills state a good deal of new business was held up awaiting the lower prices and they believe most of this will come out in a very short time. We omit prices on common iron bars for this week.

We quote soft steel bars rolled from billets at 2.35c. from old steel rails, 2.45c.

Sheets.—Manufacturers firmly believe that the reduction of \$7 per ton on all grades of sheets will have the effect of stimulating demand to a considerable extent in the near future. Several mills report that since the lower prices were made there has been a slight increase in carload orders for sheets for prompt delivery. It is very evident that a considerable tonnage in sheets is badly needed by both consumers and jobbers, whose stocks are very low, and just as soon as the trade feels that the new prices are minimum for the remainder of the year an active buying movement is expected. Sheet mills operated last week to about 65 per cent of capacity, mostly on 15 turns, but some mills operated only 12 turns. The new prices effective from March 21 are 4.35c. for No. 28 box annealed black sheets, 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized, in carloads, f.o.b. Pittsburgh. Prices on sheets, effective from March 21, are given in detail on page 852.

Tin Plate.—It is believed the reduction of 35c. per base box on tin plate will induce at least some large consumers to come in the market and place contracts for tin plate for delivery up to July 1, the tin plate manufacturers having decided not to book contracts now for second half delivery. One large manufacturer reports that since the lower price was established it has booked several contracts for delivery in second quarter and expects to secure others within a few days. The new demand for tin plate in carload lots for prompt shipment is fairly active, and it is firmly believed contracts will start to come in at an early date. For some time tin plate mills have not been operating to more than about 50 per cent of capacity, but it is believed this rate of operation will soon be increased. The new price on tin plate is \$7 per base box, and prices on all grades of terne plate have also been reduced correspondingly, or by 70c. per package of 200 lb. The new prices on terne plate are given in detail on page 852.

Wire Rods.—The reduction made on wire rods was \$5 per ton, effective from March 21, and manufacturers believe the reduced prices will result in a heavier demand in the near future, as the prices on wire and wire nails have also been reduced \$5, and this is expected to bring about a more active demand for wire products. The new price on No. 5 common basic or Bessemer rods to domestic consumers is \$52 per gross ton; chain rods and also screw, rivet and belt rods, \$60 per gross ton, while high carbon rods range from \$65 upward, according to carbons.

Wire Products.—At the conference in Washington last week prices on plain wire were placed at \$3, and wire nails \$3.25 base per keg, while the new discounts on woven wire fencing are 63 per cent off in carloads, 62 per cent in 1000-rod lots, and 61 per cent in small lots, all f.o.b. Pittsburgh. For some time there has been much irregularity in prices of cement-coated nails, and the new price on these was not fixed at Washington. However, at a later conference of makers of cement-coated nails the price was fixed at \$2.85 base per keg.

Hot-Rolled Strip Steel.—Price on this product was not named at the meeting in Washington last week, but was fixed at a conference of manufacturers of hot-rolled strip steel in New York on Monday, this week, at \$3.30 per 100 lb., this being a reduction of about \$10 per ton from the former price. Demand has been limited, the mills operating to only 60 to 70 per cent of capacity, but manufacturers believe some new business held up

waiting for the lower prices will soon come out. The mills also entered some business recently subject to the new price.

We quote hot-rolled strip steel at \$3.30 per 100 lb.

Cold-Rolled Strip Steel.—Prices on this product were not touched on at the meeting in Washington last week, but were fixed at a conference of manufacturers in New York on Monday, this week. The price agreed upon was \$5.65 base per 100 lb., a reduction of \$12 per ton from the former price.

We quote cold-rolled strip steel at \$5.65 base per 100 lb., f.o.b. Pittsburgh, for 1½-in. and wider, 0.100 in. and thicker hard tempered in coils under 0.20 carbon and under. Boxing charge 25c. per 100 lb.

Nuts and Bolts.—Prices on these products were not agreed upon at Washington last week, but a committee of the manufacturers of nuts and bolts was in session in New York for several days after the Washington meeting discussing prices, no decision being reached. A general meeting of nut, bolt and rivet makers is to be held in Pittsburgh on Thursday, March 27, at which it is expected lower prices will be adopted.

Shafting and Screw Stock.—Makers of this product have made a cut of \$7 per ton, the new discount on cold-rolled shafting in carloads being 28 per cent off and in less than carloads 16 per cent off, f.o.b. Pittsburgh. The list price on shafting is 5c., so that the new 28 per cent discount makes the net price 3.60c. per lb. The manufacturers believe the demand will soon be better, as orders were being held up waiting for the reductions in prices. The demand for shafting and screw stock for some time has been light and only in small lots for prompt shipment. The automobile trade has been buying fairly heavy for some time. Discounts in effect from March 21 are as follows:

We quote cold-rolled shafting at 28 per cent off list in carloads and 21 per cent in less than carloads, f.o.b. Pittsburgh.

Rivets.—The reduction to be made in prices of rivets has not yet been agreed upon by the manufacturers, but will probably be named at a general meeting of manufacturers of rivets to be held in Pittsburgh on Thursday, March 27. For some time structural rivets have been \$4.20 or lower, and boiler rivets \$4.30 or lower, but it is likely new prices will be still lower. The demand for rivets has been light and for only small lots for prompt shipment.

We quote button head structural rivets at \$4.20 and cone head boiler rivets at \$4.30 base, f.o.b. Pittsburgh.

Spikes.—The new and lower price adopted for standard spikes is \$3.25 per 100 lb. in carload lots of 200 kegs or more, but as yet the new prices for small spikes and boat spikes have not been fixed. These will likely be adopted at a meeting of the spike makers to be held this week. Some small inquiry is in the market for railroad spikes, and if the Government comes in and buys rails in large quantities, which it promises to do, the manufacturers of spikes expect a much heavier demand. Spike makers have not been operating to more than about 50 per cent of capacity, owing to dull demand.

We now quote standard spikes, 9/16 x 4½ in., at \$3.25 base per 100 lb. in carload lots of 200 kegs or more, plus usual extras, f.o.b. Pittsburgh. We omit prices on small spikes and boat spikes until these have been agreed upon.

Hoops and Bands.—Prices on hoops and bands have been reduced \$5 per ton, effective from March 21. Demand has been light, but manufacturers believe a good many orders were held up by consumers waiting for the lower prices, and that these will now be placed.

We quote steel hoops and bands at 3.25c. base, with the usual extras.

Skelp.—Prices on sheared and universal skelp were reduced at the meeting in Washington last week \$7 per net ton, and on grooved \$5 per net ton.

We now quote sheared steel skelp, 2.65c.; universal, 2.55c., and grooved, 2.45c. per lb., all f.o.b. Pittsburgh.

Wrought Pipe.—Prices on all tubular goods sold by discounts have been reduced \$7 per net ton. Reductions have also been made in prices on line pipe from \$5 upwards. For some time the market in iron and steel pipe has been very irregular, but manufacturers now believe the lower prices will be firmly held for the remainder of this year, as they are said to be very close

to cost. Makers state that a large amount of business has been held up by prospective buyers waiting for the lower prices and that this will soon come out. Stocks of tubular goods at all distributing centers in the country are said to be heavy, in anticipation of an early active demand. Oil country goods are active, and there is a very large amount of prospective business in sight for line pipe for gas and oil projects. The new discounts on iron and steel pipe, effective from March 21 are given on page 852.

Boiler Tubes.—There has been a straight cut of \$7 per net ton in prices on all grades of tubes. Demand has been dull, but it is believed by the manufacturers that the lower prices will soon result in more active business. The new discounts on iron and steel tubes, in effect from March 21, are given on page 852.

Coke.—It is believed conditions in the coke trade may show betterment in the near future, as the lower steel prices are expected to stimulate demand for steel products, and this would mean that some of the steel companies blast furnaces that are now idle may be started up in the near future, thus creating a larger demand for coke. However, there is not much chance of merchant blast furnaces starting up on the lower prices for pig iron; on the other hand, it is likely some merchant furnaces will have to go out, as they cannot meet the lower pig iron prices. Prompt furnace coke loaded on car can still be bought readily at \$4 to \$4.25 per net ton at oven, but furnace coke under contracts is running this month in price from \$4.25 to \$5 per net ton at oven. Now that prices on Bessemer and basic pig iron have been fixed for the remainder of the year, it is probable some contracts for blast furnace coke may be made in the near future on the basis of so many tons of coke per ton of pig iron. We quote standard makes of blast furnace coke for March shipment at \$4 to \$4.25 and standard makes of 72-hr. foundry coke at \$4.75 to \$5 per net ton at oven.

Old Material.—Sentiment in the scrap trade is undoubtedly better, and while the tone is firmer prices are not as yet actually higher. Dealers believe the lower prices on steel are going to stimulate demand and that the steel mills will operate to larger capacity than for some time, and that this will soon create a demand for scrap, which has been lacking for three months or more. It is said that several consumers have been quietly picking up scrap by direct purchases from railroads and other sources for some time, believing that prices would not go lower, and that it was an opportune time to buy. Dealers also believe that prices have probably touched bottom, and have not been trying to force sales for several weeks, but have been piling their scrap in their yards for higher prices, which they believe will come in the near future. The demand for borings and turnings has been fairly active, and prices on borings have shown a slight advance. It is believed that any further change in prices of scrap will be in the direction of higher values. No sales of moment are reported in the past week.

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$14.00 to \$15.00
No. 1 cast, for steel plants (nominal)	18.00 to 19.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh, ...	15.00 to 16.00
Compressed steel	11.00 to 12.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	11.00 to 12.00
Bundled sheet stamping	10.00 to 10.50
No. 1 busheling	13.00 to 14.00
Railroad grate bars	14.00 to 15.00
Low phosphorus melting stock	16.00 to 17.00
Low phosphorus melting stock (bloom and billet ends, heavy plates)	19.00 to 20.00
Iron car axles	31.00 to 32.00
Locomotive axles, steel	29.00 to 30.00
Steel car axles	31.00 to 32.00
Railroad malleable	13.00 to 14.00
Machine shop turnings	9.50 to 10.00
Cast iron wheels	21.00 to 22.00
Roller steel wheels	16.00 to 17.00
Sheet bar crop ends (at origin)	19.00 to 20.00
Heavy steel axle turnings	11.00 to 12.00
Heavy breakable cast	18.00 to 19.00
Cast iron borings	10.50 to 11.00
No. 1 railroad wrought	18.00 to 19.00

Chicago

CHICAGO, March 25 (*By Wire*).

The lower price levels of various iron and steel products which were evolved from the united effort of Government and industry to revive activity have not been long enough in existence to bring about any marked result, but the steel trade is optimistic. The principal effect so far has been a flood of letters in which consumers inquire as to the prices and their bearing on contracts. Many promises have been made, and in a few cases fabricators of structural steel have begun to stock up. The prices of some products, which are correlated to those fixed, have not been determined. In bar iron, bolts and nuts and other products, only tentative quotations have been made, but definite prices will soon be worked out. Cast-iron pipe has been reduced \$5 per ton.

The makers of Lake Superior charcoal iron say the prices fixed for the fourth quarter of 1918 will hold to July 1, and that they have not canceled or revised a single contract. It is the general statement of the pig iron trade that the new prices now named will not affect contracts, and that on new business a reduction of \$4.25 will be general. There are offers to take Southern iron if the Northern basis is met, but it is questionable whether the Southern producers will assume the \$5 freight in addition to the reduction.

Old material is gaining in strength, some consumers buying to meet future demand.

Meanwhile the situation with the mills is temporarily worse than it was a week ago. The leading interest has dropped to 80 per cent of capacity. For the moment it is not quoting on track accessories, apparently waiting to arrive at some further price determination. The leading independent started its plate mill to-day after a week's idleness, with orders in hand sufficient to carry it along about a week. Another mill producing both steel and bar iron contemplates a shut-down of two to three weeks, at the end of which time it believes resumption will be justified. The new prices on steel have been made effective from March 21, and they will be allowed on contracts except where the material was purchased for a specific purpose which allowed for the old price. The iron and steel warehouse differential is \$15.

Ferroalloys—Eighty per cent ferromanganese can be had from makers at \$150, delivered, but little is being done. The nominal quotations for ferrosilicon are unchanged. Some makers hold spiegeleisen at about \$45.

We quote 80 per cent ferromanganese nominal at \$150 delivered; 50 per cent ferrosilicon at \$125 to \$130, delivered, and 16 to 18 per cent spiegeleisen at \$40 to \$50 furnace.

Plates—As with other steel products, consumers have not had time to take hold at the new and lower prices. The leading local independent started its plate mill to-day after a week's idleness with enough specifications in sight for the week, but not much beyond. It is hoped that additional bookings will be made this week to give the outlook a better aspect.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Pig Iron—It is generally accepted that the reduction of \$4.25 will correspondingly affect all grades with the exception of charcoal iron, the sentiment in this latter direction being that Lake Superior charcoal iron prices will not be changed for first half delivery. An important Michigan furnace interest states that all are using the Government's prices in effect in the fourth quarter of 1918, and that they have not canceled or rewritten a single contract. Many inquiries are being received by pig iron sellers, but most of them aim at learning whether contract prices will be revised to accord with the new schedule, and the answer is negative. There is a dearth of high phosphorus iron in this market evidenced by inquiries from the stove makers, but in some cases they want Southern furnaces to meet the Northern price. This would mean that the Southern furnaces would have to stand, aside from the general reduction, the freight of \$5 per ton, and it is questionable whether the most efficient Southern makers

would agree to an aggregate reduction of \$9.25. They maintain that their costs are such to-day as to give them but little or no profits. At present over 50 per cent of the Southern furnaces are out of blast and reports indicate that more will blow out. The future of the Southern furnaces depends to a very great degree on the extent to which they will be able to effect economies in operation.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5..	\$38.70 to \$39.00
Lake Superior charcoal, C to AA....	40.70 to 42.50
Lake Superior charcoal, No. 6.....	41.20 to 41.50
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry.....	26.75
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25.....	34.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	33.00
Southern foundry, silicon, 1.75 to 2.25.....	31.75
Malleable, not over 2.25 silicon.....	27.25
Standard Bessemer	27.95
Basic	25.75
Low phosphorus (copper free).....	48.25
Silvery, 7 per cent.....	41.15 to 41.55

Structural Material—Fabricators are showing a disposition to build up their stocks, but not a great deal has been done yet. The great hope lies in the pending propositions to which reference has been made from time to time, such as the 9000-ton Butler building on which bids have again been asked. The Decatur Bridge Co. will fabricate 265 tons to enter a building for the Staley Mfg. Co., Decatur, Ill. The leading independent is operating its structural mill irregularly. It has enough in hand to run its 24-in. mill through April. Its 28-in. mill is down for a couple of days, but is expected to resume Wednesday and finish out the week.

The mill quotation is 2.45c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. for material out of warehouse.

Cast Iron Pipe—Saginaw, Mich., will take bids March 25 on 350 tons; Mitchell, S. D., on April 10 for 225 tons, and Akron, Ohio, April 18 for 4570 tons of large pipe. The makers have reduced their prices \$5 per ton, extras are unchanged.

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$59.80; 6-in. and larger, \$56.80; class A and gas pipe, \$1 extra.

Wire Products—The reduction to \$3.25 per keg for wire nails has stimulated inquiry, but not much increased business has yet resulted. For prices see finished iron and steel f.o.b. Pittsburgh, page 852.

Rails and Track Supplies—It is reliably reported that railroad purchasing agents have been authorized to proceed and make such purchases as they can finance, this giving them a little more freedom to act if they can find the money. The leading interest is temporarily withholding quotations on track accessories. Another large interest quotes: spikes, 3.30c.; track bolts, 4.30c.; steel tie-plates, 2.65c. Pittsburgh or Chicago; light rails, 2.45c. Makers of iron tieplates have not arrived at a price. We quote:

Standard railroad spikes, 3.30c., Pittsburgh. Track bolts with square nuts, 4.30c., Pittsburgh. Tie plates, steel, 2.65c. Pittsburgh and Chicago; tie plates, iron, —, f.o.b. makers' mills. The base for light rails is 2.45c., f.o.b. maker's mills, with usual extras.

Sheets—Enough business to round out the week and perhaps go further is in the hands of the leading independent and it is expected that the market will soon be stimulated by the lower prices. For mill quotation see finished iron and steel f.o.b. Pittsburgh, page 852.

Jobbers quote Chicago delivery out of stock: No. 10 blue annealed, 4.57c.; No. 28 black, 5.37c., and No. 28 galvanized, 6.72c.

Mill quotations are 4.35c. for No. 28 black, 3.50c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized.

Bars—It does not appear to what level common bar iron will settle, but on such quotations as producers are making, they name the new quotation for steel bars, 2.35c., Pittsburgh, this being equivalent to

2.62c. Chicago, although as low as 2.50c., Chicago, has been quoted. A meeting is scheduled for Tuesday of next week at which the bar-iron makers will discuss costs, etc., and in the meantime, it is thought, Washington may have something to say. Some steel bar mills are not running on good schedule, though they have enough business in sight for a few weeks, rail carbon bars are tentatively quoted at 2.45c., mill.

Mill prices are: Mild steel bars, 2.35c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.62c., Chicago; refined iron bars tentatively 3.30 to 4.05c.; rail carbon, 2.45c., mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Bolts and Nuts.—Business is still more or less at a halt, but is expected to resume when reduced prices are announced as will be done in a day or two. For mill prices see finished iron and steel f.o.b. Pittsburgh, page 852. Jobbers quote:

Structural rivets, 4.87c.; boiler rivets, 4.97c.; machine bolts up to $\frac{3}{8}$ x 4 in., 45 and 5 per cent off; larger sizes, 40 off; carriage bolts up to $\frac{3}{8}$ x 6 in., 40 and 10 off; larger sizes, 35 off; box pressed nuts, square topped, 78c. off; hexagon tapped, 57c. off; coach or lag screws, gimlet points, square heads, 40 and 10 per cent off. Quantity extras for nuts are canceled.

Old Material.—Despite the lack of buying on the part of consumers, the market has a continued better feeling, largely due to the willingness of dealers to pay higher prices to get material wherewith to serve the activity they see ahead. Cast scrap continues a strong feature. A local mill which is down for lack of business has ordered a suspension of shipments. In neither steel nor the rolling mill grades has there been any activity. The Illinois Central and the Rock Island have issued lists, the principal offering of the former being No. 1 wrought, and of the latter No. 2 wrought.

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	\$21.00 to \$22.00
Relaying rails	45.00 to 50.00
Carwheels	21.00 to 22.00
Steel rails, rerolling	16.50 to 17.00
Steel rails, less than 3 ft.	17.00 to 17.50
Heavy melting steel	16.00 to 16.50
Frogs, switches and guards cut apart ..	15.50 to 16.00
Shoveling steel	15.50 to 16.00

Per Net Ton

Iron angles and splice bars	\$19.00 to \$20.00
Steel angle bars	15.00 to 15.50
Iron arch bars and transoms	22.50 to 23.50
Iron car axles	28.00 to 29.00
Steel car axles	22.50 to 23.50
No. 1 busheling	14.00 to 14.50
No. 2 busheling	9.50 to 10.00
Cut forge	14.50 to 15.00
Pipes and flues	12.00 to 12.50
No. 1 railroad wrought	16.00 to 16.50
No. 2 railroad wrought	14.50 to 15.00
Steel knuckles and couplers	17.50 to 18.00
Coil springs	18.00 to 18.50
No. 1 cast	22.00 to 22.50
Boiler punchings	18.00 to 19.00
Locomotive tires, smooth	16.50 to 17.00
Machine shop turnings	6.00 to 7.00
Cast borings	9.25 to 9.75
Stove plate and light cast	16.00 to 16.50
Grate bars	15.25 to 15.75
Brake shoes	14.00 to 14.50
Railroad malleable	16.00 to 17.00
Agricultural malleable	15.50 to 16.00
Country mixed	10.00 to 11.00

Philadelphia

PHILADELPHIA, March 25.

No marked increase in inquiries or orders for steel or pig iron has resulted from the adoption of lower prices at Washington last week. This, however, is not surprising to the trade, which hardly looked for tangible results so soon. It is pointed out that the consuming trade must have time to digest the new prices and decide upon a buying policy before any great volume of business will be forthcoming. It is argued by sellers that as soon as consumers become convinced that the prices, as named, are to remain in effect throughout the year, whatever hesitancy may still exist will soon disappear. A question of great interest to the steel companies is, when will the railroads come into the market? No other factor is so important, it is asserted, in restoring normal conditions in the industry as the resumption of buying by the railroads. Financing

plans of the Railroad Administration, it is believed, will soon provide for betterments that will include large purchases of steel.

Producers have had no indication that the reductions of \$5 a ton on semi-finished steel, \$7 on finished material and \$4.25 on pig iron are unsatisfactory to the consuming trade, with the possible exception that there is an intimation from the building trade that investment builders may not go ahead with much work of an important nature. A fair amount of general building, not for investment purposes, is in prospect, however.

A point which the steel companies are emphasizing is that the new prices are minimum quotations, and they point out that while there is no likelihood of any further reductions this year, it should not be assumed by consumers that higher prices will not later be quoted, should demand and conditions justify.

Practically all of the large steel companies are revising prices on all business on their books to the new figures, with the exception of contracts for specific work, such, for example, as steel for ships. Jobbers' orders are being revised without question.

The scrap market has again shown that it is a law unto itself by exhibiting marked firmness in the face of declines in other materials. Liquidation of prices of scrap has been going on for three months or more, and quotations are now firmer, probably because of expectations that the new steel and pig iron prices will stimulate greater activity.

At a meeting of the American Pig Iron Association in Pittsburgh Wednesday efforts will be made to straighten out a number of tangles in the pig iron situation, one of the most important being whether Eastern furnaces shall quote the new prices on a Pittsburgh basis and Virginia, Tennessee and Alabama furnaces on a Birmingham basis.

Pig Iron.—The pig iron trade is badly muddled by the action taken at Washington last week making a reduction of \$4.25 on basic iron with "basing points and differentials unchanged," to quote the official report. The inference is that the basing points and differentials which were in effect during the last three months of Government price control are to be re-established, and this means that furnaces east of the Allegheny Mountains will quote on a Pittsburgh basis and those south of the Potomac, including Virginia, Tennessee and Alabama, on a Birmingham basis. This will be a workable plan for eastern Pennsylvania and New Jersey furnaces, but it will place Virginia, Tennessee and Alabama furnaces in a position where they will not be able to compete on anything like an even basis for business in the North. For example, if Pittsburgh and Birmingham basing points are restored, the price of No. 2 plain foundry iron delivered in the Philadelphia district will be \$30.65 from an eastern Pennsylvania furnace and \$33.25 from a Virginia furnace or an Alabama furnace, and with this disadvantage it will be difficult, if not impossible, for the Southern furnaces to obtain any business in Northern markets. While this difference in delivered prices existed during the war, conditions are different now. There is scarcely any consuming point at which the Virginia and Alabama furnaces would not work under a great disadvantage if they sold on a Birmingham basis, as the following comparisons of Birmingham and Pittsburgh freight rates will show: To Baltimore, Birmingham rate, \$5.60; Pittsburgh rate, \$3.70; to Harrisburg, Birmingham rate, \$5.90; Pittsburgh rate, \$3.70; to Coatesville, Pa., Birmingham rate, \$6.60; Pittsburgh rate, \$3.90; to Philadelphia, Birmingham rate, \$6.50; Pittsburgh rate, \$3.90; to Jersey City, Birmingham rate, \$6.90; Pittsburgh rate, \$4.30; to Burlington, N. J., Birmingham rate, \$6.80; Pittsburgh rate, \$3.90; to New York, Birmingham rate, \$7.70; Pittsburgh rate, \$4.30; to Boston and points taking same rate, Birmingham rate, \$8; Pittsburgh rate, \$4.70. At some of the extreme points, such as New York and New England, Alabama and Virginia furnace prices would be so far out of line with those quoted by eastern Pennsylvania and Buffalo furnaces that little or no business could be negotiated. A suggestion is made that all of the Southern furnaces quote on a Pittsburgh basis, which would place them

on even terms as to delivered prices, but would make the prices at furnaces so low that it is predicted many producers could not sell except at a loss. A meeting of the American Pig Iron Association has been called for Wednesday in Pittsburgh and it is the hope of the trade that a workable plan may be decided upon which will be fair to furnacemen in all sections. Under the new price schedule No. 2 foundry iron is \$1 above the price of basic, gray forge is the same as basic, while low phosphorus iron for the present is to be quoted \$.425 below the figures effective since Jan. 1. Unless it should otherwise be decided, pig iron sellers will quote eastern Pennsylvania iron on a Pittsburgh basis and Virginia iron on a Birmingham basis. Western Pennsylvania furnaces apparently have not yet adopted a policy. They were not permitted to sell on a Pittsburgh basis during the last quarter of 1918. With a freight rate of \$2.80 to Philadelphia, some of them would be able to undersell eastern Pennsylvania furnaces if the latter adopt the Pittsburgh base. We quote standard grades of iron for delivery in Philadelphia and vicinity, except low phosphorus, which is quoted f.o.b. furnace:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	\$31.90
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	30.65
Virginia No. 2 X (2.25 to 2.75 sil.)	34.50
Virginia No. 2 plain (1.75 to 2.25 sil.)	33.25
Basic	29.65
Gray forge	29.65
Standard low phosphorus (f.o.b. furnace)	46.75
Copper-bearing low phosphorus (f.o.b. furnace)	45.25

Ore.—Two cargoes of low phosphorus iron ore from Spain were received at Philadelphia last week, one of 7,093 tons, valued at \$75,000, and another of 4,645, valued at \$46,500.

Ferroalloys.—Producers of ferromanganese have reduced their asking price to \$150 for 70 per cent, but as resale lots are offered at around \$130 for the 80 per cent the furnaces are taking no business. About 3,000 tons of British ferromanganese has arrived at Philadelphia in the past two weeks, applying on old contracts, some made as far back as 1916, at prices ranging from \$38 to \$200. Importers have declined to deliver material bought at the extremely low prices unless high-priced tonnage is also taken. Consequently many of these old contracts have been "married" at prices averaging \$119. A considerable part of the resale ferromanganese now on the market is the British product. Spiegeleisen is not in demand, but is quoted at \$40, f.o.b. furnace, for 18 to 22 per cent. There is a probability that it could be bought for \$40 delivered.

Coke.—No action on coke prices was taken at Washington because it was believed they had declined as far as might be expected under existing conditions. Furnace coke is obtainable at \$4 and foundry coke at \$6, Connellsville.

Semi-Finished Steel.—New prices now quoted by the mills show a \$5 per ton reduction, but this has brought out no inquiry. Re-rollers of billets and slabs maintain that the prices for finished steel leave no profit as the reduction on finished steel is \$2 a ton more than on semi-finished. We quote 4 x 4 in. open-hearth rerolling billets at \$42.50; 2 x 2 in. billets, \$46; sheet bars, \$46; slabs, \$45, and forging billets, \$55, all Philadelphia, there being a \$4 a ton freight rate from Pittsburgh included in these prices.

Plates.—About 10,000 tons of plates have been inquired for in this market since the new price was announced. It is expected that this business will soon be closed. High-cost plate mills will quote the new price though doubtful whether they can break even. There is a feeling of optimism among sellers that the reduced price will bring out a goodly amount of business within the next 30 days. We quote sheared plates, 1/4 in. and heavier at 2.895c. per lb., Philadelphia.

Structural Material.—Steel fabricators get reports from architects that a fair amount of building work may soon be decided upon now that lower prices for steel have been named, though the \$7 reduction is admittedly insufficient from the viewpoint of the investment builder. Bids were received last week on a National Guard armory to be built in Philadelphia, requiring 550 tons of steel. George F. Pawling & Co.,

Philadelphia, were low bidders. We quote plain material at 2.695c. per lb., Philadelphia.

Bars.—No prices on bar iron were named at the Washington conference last week, but makers got together on Monday and agreed to quote 2.35c., Pittsburgh, on common merchant iron. For delivery in Philadelphia and at points taking the Philadelphia freight rate 24 1/2 c. per 100 lb. is added. The new price for soft steel bars is 2.35c., Pittsburgh, or 2.595c., Philadelphia.

Sheets.—The reduction of \$7 a ton on sheets makes the following prices now effective for delivery in the Philadelphia district: No. 10 blue annealed, 3.795c.; No. 28 black, 4.595c.; No. 28 galvanized, 5.945c.

Wire Products.—All orders which the mills have on their books will, it is stated, be revised to the new prices, which are 3c. for plain wire and 3.25c. for nails, Pittsburgh. Jobbers have already insisted upon this revision in a number of instances. Wire rods have been reduced \$5 a gross ton, making the new price \$52, Pittsburgh.

Rails.—Mills are hopeful that the Railroad Administration will soon arrange financing for the purchase of rails. Street railway companies are also said to be in need of rails which may be bought soon. The new prices are \$45 per gross ton for heavy Bessemer rails and \$47 for heavy open-hearth rails, f.o.b. mill. Light rails (under 45 lb.) are reduced \$11 a net ton to 2.45c. No price was named at the Washington conference on rerolled rails.

Old Material.—The scrap market is decidedly firmer. An Eastern steel company has bought a large tonnage of heavy melting steel and it is reported the minimum price paid was \$14.50, delivered, but only a part of its requirements could be obtained at that figure. Consumers are now unable to make purchases below \$15 to \$16, which we now quote as the market price. No. 2 heavy melting steel has been sold at \$14.25, delivered. Other grades of scrap are also firmer, No. 1 low phosphorus having been sold at \$23 to \$24, though these prices were for very high grade material, mostly plate croppings. Short shoveling turnings are in demand and command a premium of about \$2 a ton over ordinary bushy turnings. Three or four Eastern consumers will now accept only the short shoveling grade. No. 1 cast scrap is also in better demand, the price being firmer. No. 1 railroad wrought has advanced \$1 a ton. Scrap dealers expect that any increase in steel manufacture due to the announcement of reduced prices will soon be reflected in a better demand for scrap and the feeling among dealers and brokers is much more bullish than it has been for weeks. We quote for delivery at consumers works eastern Pennsylvania as follows:

No. 1 heavy melting steel	\$15.00 to \$16.00
Steel rails, rerolling	17.00 to 17.50
No. 1 low phosphorus, heavy, 0.04 and under	22.50 to 23.00
Iron rails	20.00 to 22.00
Carwheels	23.00 to 24.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 yard wrought	19.00 to 20.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	12.00 to 13.00
Bundled skeleton	12.00 to 13.00
No. 1 busheling	15.00 to 16.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use)	11.50 to 12.50
Ordinary turnings (for blast furnace use)	9.50 to 10.50
Machine-shop turnings (for rolling mill use)	11.00 to 12.00
Cast borings (for blast furnace use)	9.50 to 10.50
Cast borings (clean)	13.50 to 14.00
No. 1 cast	22.00 to 23.00
Grate bars	18.00 to 19.00
Stove plate	18.00 to 20.00
Railroad malleable	18.00 to 20.00
Wrought iron and soft steel pipes and tubes (new specifications)	17.00 to 17.50
Ungraded pipe	13.00 to 14.00

Acme Die Casting Corporation, Brooklyn, N. Y., is now rushed with domestic work, last year having operated 24 hours daily for the Government. The company started four years ago in a space of 6000 sq. ft., which has now been increased to 50,000.

Cincinnati

CINCINNATI, March 25—(By Wire).

Pig Iron.—There has been some misunderstanding as to whether the new recommended price on pig iron of \$25.75 represented both basic and foundry, but this has now been cleared up and \$26.75 is the figure that sellers are working on. Information comes from the South that so far all furnaces have not formally accepted the latter figure. However, there is enough iron offered to establish the market on this basis, providing any transactions are reported. It is further reported that one of the leading interests in southern Ohio is not willing to sell iron ahead at the new schedule. The reason given by the dissenting producers is that their costs will not permit them to take on contract business unless there should be some readjustment in wages. A great deal of complaint is heard from the South that the inefficiency of labor at the present time is an item that has increased production cost much beyond what it should be. Makers of charcoal iron are under the impression that former prices will not be disturbed, as it is generally realized that none can be produced in any district and marketed below the former figure without sustaining heavy losses. Foundry iron production in the Birmingham district is declining rapidly because so many furnaces have been blown out lately and it is the announced intention of several companies to blow out as soon as they have produced sufficient iron to take care of contracts on their books. Some melters have been laboring under the misapprehension that the new prices will be retroactive and apply on shipments of contracts. There is very little, if any, improvement in the inquiry and sales are still confined to car lots. However, the general opinion is that business will open up at an early date.

Based on freight rates of \$3.60 from Birmingham and \$1.00 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, silicon 1.75 to 2.25 (base price).....	\$30.35
Southern coke, silicon 2.25 to 2.75 (No. 2 soft).....	31.60
Southern gray forge.....	29.35
Ohio silvery, 8 per cent silicon.....	42.05
Southern Ohio coke, silicon, 1.75 to 2.25 (No. 2).....	28.55
Basic, Northern.....	27.55
Standard Southern carwheel.....	51.60

Coke.—Conditions in the coke market remains in statu quo. Connellsville producers are still leading in low quotations. Some furnace coke in that field, that is said to be off grade, has been sold around \$3.75 per net ton at oven, and some foundry coke as low as \$4.25. Leading brands range from \$4.25 to \$5 for furnace coke and from \$5 to \$6 for foundry coke. Wise County furnace coke is now around \$6 at ovens and foundry coke \$7. New River producers are still endeavoring to maintain a price of \$8 at oven for both furnace and foundry coke, and within the past few days several carloads of high grade foundry coke have been sold at this figure.

Fluorspar.—Curtailement of activities by the steel mills is given as the reason for the present dull conditions. There is practically no demand for fluorspar, although shipments on old contracts are not being held up to the extent that they were two weeks ago. Washed gravel fluorspar on an approximate analysis of 85 per cent and over calcium chloride and 5 per cent and under in silicon is quoted around \$25 per ton at point of shipment. Some fluorspar sold on a guaranteed analysis basis brings as high as \$31 per ton.

Finished Material.—Both the mills and warehouses in this territory have adopted the new schedule of prices, although the latter were not able to figure out quotations until Monday morning. The mill quotation on No. 28 black sheets is 4.35c., galvanized, 5.70c.; No. 10 blue annealed, 3.55c., all Pittsburgh basis. Freight rate to Cincinnati is 23c. per 100 lb. There is not much business coming in, as buyers have not yet received definite information and those who have the figures in hand have not had time to digest them. Indications are that building operations will commence at an early date, but the drawback at the present time is the present high cost of labor. Until this matter has been ad-

justed, there may be a further hesitancy on the part of building contractors to resume operations on a very much larger scale and incidentally to place any large orders for structural material. The warehouse quotation on cold-rolled shafting has not yet been figured out.

The following are present local jobbers' prices. Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates, $\frac{1}{4}$ -in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c., and wire nails, \$3.85 per keg base.

High Speed Steel.—Leading makers have made no changes and are quoting at \$1.75 per lb. Some grades of high speed steel can be purchased as low as \$1.40, which is a reduction of 10c. per lb. over quotation named last week by this maker.

Old Material.—Reports from nearly all dealers agree that business is practically at a standstill. Some small lots are being bought by foundries in outside territory, which are running short, but most of the local foundries have enough scrap on hand or contracted for to carry them along for some time. Steel mills are not inclined to buy far ahead at the present prices, although they are considered to have reached the bottom. The reduction on pig iron will probably have no effect on the scrap market either one way or the other, and in some quarters it is thought that it may have a stabilizing effect that will be of some benefit to the trade before very long. No changes in any grades are reported. The following are dealers' prices f.o.b. cars Cincinnati and southern Ohio in carload lots:

Per Gross Ton		
Bundled sheet.....	\$9.00 to	\$9.50
Old iron rails.....	22.50 to	23.00
Relaying rails, 50 lb. and up.....	40.00 to	41.00
Revolving steel rails.....	14.00 to	14.50
Heavy melting steel.....	12.00 to	12.50
Steel rails for melting.....	12.50 to	13.00
Old carwheels.....	15.00 to	15.50
No. 1 railroad wrought.....	13.00 to	13.50
Per Net Ton		
Cast borings.....	\$5.00 to	\$5.50
Steel turnings.....	5.00 to	5.50
Railroad cast.....	15.50 to	16.00
No. 1 machinery.....	17.00 to	17.50
Burnt scrap.....	11.00 to	11.50
Iron axles.....	23.00 to	23.50
Locomotive tires (smooth inside).....	14.00 to	14.50
Pipes and flues.....	10.50 to	11.00
Malleable cast.....	11.00 to	11.50
Railroad tank and sheet.....	9.00 to	9.50

Buffalo

BUFFALO, March 24.

Pig Iron.—Producers in this district are as a rule inclined to acquiesce readily to the new price schedule determined upon at the conference of the iron and steel committee and the Government representatives, without much divergent opinion and the feeling prevails that it will work out to the benefit of the entire industry because of the price stabilization which will result covering a considerable period if not to the end of the year and tend to stimulate and bring out business. In fact, a fair tonnage of inquiry has already appeared in the market since the announcement of the new schedule, aggregating more than has been in evidence for some time, and it looks as though this inquiry will materialize into actual orders. We quote the new price schedule, f.o.b. furnace, Buffalo, as follows:

No. 1 foundry, 2.75 to 3.25 silicon.....	\$29.75
No. 2 X, 2.25 to 2.75 silicon.....	28.00
No. 2 plain foundry, 1.75 to 2.25 silicon.....	26.75
Gray forge.....	25.75
Malleable, silicon not over 2.25.....	27.25
Basic.....	25.75
Basic, 1 to 1½ per cent mng.....	26.25
Basic, 1½ to 2½ per cent mng.....	26.75
Bessemer.....	27.95
Lake Superior charcoal, regular grades.....	38.50

Finished Iron and Steel.—The comments made on the price realignment announced by the steel committee are all favorable, and from present indications it is going to have the desired effect of instilling confidence. A considerable number of orders for finished materials that had been held back waiting for announcement of the new prices has been released. It is understood that heavy tonnages of plates and cold-finished steel to be used in connection with automobile

production have already reached selling agencies and there are indications that during the week a considerable tonnage of wire products will be placed, for it is known that retail customers have been holding back in their spring buying. It is not thought that there will be an immediate rush of business, but that orders will gradually increase. Under the new price schedules warehouse prices have been adjusted on a differential advance of \$15 per ton above mill prices, Pittsburgh base, plus freight to destination, making bars 3.32c.; structural, 3.42c.; plates, 3.62c. and bands and hoops 4.02c.—f.o.b. Buffalo.

Old Material.—The market is giving some evidence of a turn for the better as a result of the announcement of the fixing of prices for finished materials decided upon at Washington. Dealers, at any rate, expect that there will be an improvement over recent conditions and a strengthening in demand in prices for scrap commodities and are optimistic in the belief that new business will commence to develop shortly. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades..	\$14.00 to \$15.00
Low phosphorus, 0.04 and under.....	19.00 to 20.00
No. 1 railroad wrought.....	18.00 to 19.00
No. 1 machinery cast.....	21.00 to 22.00
Iron axles	23.00 to 24.00
Steel axles	23.00 to 24.00
Carwheels	21.00 to 22.00
Railroad malleable	17.00 to 18.00
Machine shop turnings.....	7.00 to 8.00
Heavy axle turnings.....	13.00 to 14.00
Clean cast borings.....	9.00 to 10.00
Iron rails	21.00 to 22.00
Locomotive grate bars.....	16.00 to 17.00
Stove plate	17.00 to 18.00
Wrought pipe	13.00 to 14.00
No. 1 busheling	13.00 to 14.00
Bundled sheet stamping.....	11.00 to 12.00

Cleveland

CLEVELAND, March 25.

Iron Ore.—The ore trade is generally satisfied with the decision of the Washington price conference, leaving unchanged for 1919 Lake Superior ore prices which are named for delivery at lower lakes, but subject to any changes that may be made in freight rates. Consequently, if these rates are lowered, the consumers and not the ore producers, will reap the benefit. The appeal of the ore men for a reduction of the \$1 rail rate from the mines to the upper lake docks is still pending in Washington, and no intimation is given as to when a decision will be rendered by the Railway Administrator. While the ore men feel that they presented a strong case in favor of reduced rail rates, they do not display a great deal of confidence that any reduction will be made. The former rail rate was 63½c., but this was advanced to \$1 by the Government. Vessel owners have not yet taken up the matter of the season's rates for ore, but these rates may be reduced somewhat, possibly 25c. per ton. At present, the rate from Duluth to lower lake docks, including unloading, is \$1.10. While it is expected that some demand for ore will spring up during the next few weeks now that prices are established, a general buying movement is not looked for until there is considerable revival in the demand for finished steel and pig iron. The ore prices as established for this year were placed in effect Oct. 1, 1918, by the War Industries Board, which granted a price advance of 25c. per ton on that date. This advance did not cover over 20 per cent of the ore shipped last season. The present prices are 70c. a ton higher than the ore prices at the opening of the season a year ago. We quote, f.o.b., lower lake ports, as follows:

Old range Bessemer, \$6.65; old range non-Bessemer, \$5.90; Mesaba Bessemer, \$6.40; Mesaba non-Bessemer, \$5.75.

Pig Iron.—Pig iron producers generally are dissatisfied with the new pig iron prices. It is claimed that few furnaces in the Central territory will be able to make iron at the reduced prices and that some of the merchant stacks will have to go out of blast. Operators of merchant furnaces also feel that they have not fared as well as the steel makers in the price readjustment. They point to the fact that with a decline of approximately 50 per cent in scrap and with pig iron lowered 14 per cent, a reduction of only about 10 per

cent has been made on semi-finished steel. One of the topics taken up at a meeting of the pig iron producers of the Central district held in Cleveland March 21, was the position the producers will take on revising existing contracts. Producers are taking a very firm stand that no revision in prices on these contracts shall be made. A large proportion of the iron now under contract was purchased last year, and the price in these contracts has already been reduced \$3 per ton following the price reduction Jan. 1. Furnaces are already getting requests from consumers that their contracts be revised to the new basis. Another matter that is being discussed by the pig iron producers and which probably will be taken up at a meeting to be held in Pittsburgh Wednesday is the question of basing points for iron. Cleveland furnaces have adopted a Valley basing point for pig iron, going back to the plan that prevailed under the competitive market conditions that existed before the war, and which gave furnaces the advantage of location. While it is too early to determine whether this plan will be finally adhered to, several small lot sales of foundry iron were made this week by Cleveland interests to local consumers with the Valley as the basing point. This makes the delivered price \$28.15, or \$1 higher than if Cleveland were used as the basing point, the \$1.40 freight rate from the Valley being partly offset by the local 40c. switching charge. Although some improvement is expected in the demand now that the price question is disposed of, it is not believed that there will be a great increase in the volume of business until the demand for steel improves materially. We quote delivered Cleveland as follows:

Bessemer	\$29.35
Basic	27.15
Northern No. 2 foundry.....	28.15
Southern No. 2 foundry, silicon 2.25 to 2.75..	33.00
Gray forge	27.15
Ohio silvery	42.65
Standard low phos., Valley furnace.....	45.75

Finished Iron and Steel.—The reduction in steel prices is meeting with general approval in the trade, which appears confident that lower prices will greatly stimulate business in various lines that have been held back by high prices. There has been a marked increase in orders and inquiries since the new prices were announced. While the bulk of the orders represent business that has been held back recently for the price readjustment, there is a more scattered volume of inquiry from industries that have been buying very little steel during the past few months. Leading mills have decided to adjust contracts to the new prices except for material ordered for specific work and except in cases where there is still low-priced material on their books on old contracts. The falling off of orders for semi-finished steel pending price readjustments has resulted in the closing down of the steel plant of the McKinney Steel Co., Cleveland, and the blowing out of one of its blast furnaces. The company, however, expects to resume operation in its open-hearth department within two weeks. New orders are largely for steel bars, although some good orders for plates are coming from boiler manufacturers. An Eastern plate mill is now taking orders in this territory at 2.65c. mill, instead of the market price, f.o.b. Pittsburgh, as it had been doing recently. The American Shipbuilding Co. has received no confirmation of the report from Washington that the Emergency Fleet Corporation has canceled extensive boat orders with Lake shipyards. Nearly all the steel for boats being built by this company has been shipped, and as far as is known here the only cancellation was one boat placed with a Toledo shipyard. Considerable activity in the building field is expected to follow the reduction in prices. The Cleveland Automobile Co. has placed 500 tons of reinforcing bars for its new plant, and the Standard Parts Co. will place shortly 500 tons of structural material for a factory building in Flint, Mich. It is announced that new prices on cold-rolled and cold-drawn steel are 48 per cent off the list for carload lots, and 23 per cent for smaller lots, or \$7 per ton reduction. A similar reduction is made on standard spikes, which are now \$3.30 per 100 lb. Makers of hard steel bars have marked prices down to the carbon steel price, and

are charging the extra for twisting. Cleveland rolling mills will meet the steel price by quoting bar iron at 2.55c., Pittsburgh. The regular price on wire is now being quoted to manufacturers instead of 10c. above jobbers. Cement-coated nails have been reduced \$11 per ton to 2.85c. The warehouse differential has been reduced from \$20 to \$15 per ton. New warehouse prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.87c.; rods and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Alloy and Tool Steel.—Alloy steel prices have not been changed since the reduction in carbon steel prices. While some say alloy steel has already reached a low level, others looked for a further reduction of ¼c. per lb. The high-speed tool steel market is demoralized because of a large amount of resale steel being offered in Detroit. Some manufacturers have further reduced their prices to \$1.75.

Bolts, Nuts and Rivets.—A meeting of bolt, nut and rivet manufacturers will be held in Pittsburgh Thursday to take up prices. A sharp cut is expected in bolts, on which prices were not reduced when steel came down in January, and rivet prices will probably be revised to meet the present situation. Some good rivet orders came from the shipyards during the week.

Old Material.—The announcement of the new steel and pig iron prices has resulted in a stiffening of the scrap market. Dealers believe that the reduced prices will stimulate the demand for steel, result in a better demand for scrap, and bring many of the mills in the market before long. Heavy melting steel has been marked up 25c. a ton, and several other grades have advanced 50c. or more. Sales of heavy melting steel for Canton delivery are reported at \$16 and dealers are in the market for more material at that price for the same delivery. Borings and turnings are plentiful and have been affected but little by the strengthening of the market. Malleable scrap has advanced sharply as a result of the fair volume of activity in this grade. Little new inquiry has come from the mills, transactions for the most part being between dealers who are covering on short sales. We quote delivered consumers' yards in Cleveland and vicinity per gross ton, as follows:

Heavy melting steel	\$14.75 to \$15.25
Steel rails, under 3 ft.	18.50 to 19.00
Steel rails, rerolling	15.00 to 16.00
Iron rails	23.00 to 24.00
Iron car axles	29.50 to 30.00
Steel car axles	27.00 to 27.50
Low phosphorus melting scrap ..	16.00 to 16.50
Cast borings	9.00 to 9.50
Iron and steel turnings and drillings ..	7.50 to 8.00
Compressed steel	13.00 to 13.50
No. 1 railroad wrought	17.00 to 17.50
Cast iron car wheels	17.00 to 18.00
Agricultural malleable	14.00 to 15.00
Railroad malleable	16.00 to 16.75
Steel axle turnings	12.50 to 13.00
Light bundled sheet scrap	8.50 to 9.50
No. 1 cast	21.50 to 22.00
No. 1 busheling	13.50 to 14.50
Drop forge flashings, 10 in. and under ..	13.00 to 13.50
Drop forge flashings, over 10 in.	8.50 to 9.50
Railroad grate bars	15.50 to 16.00
Stove plate	16.75 to 17.50

Birmingham

BIRMINGHAM, ALA., March 25 (By Wire).—Inquiries for two lots of basic iron aggregating 70,000 tons have been received by Birmingham iron masters. Three different interests have sold small lots at the new base, but there has been no noticeable increase in actual business booked. The general opinion is that it will be 10 days before consumers and their customers can get together on new business, after which a very substantial buying movement is expected. The Alabama Co. will blow out its active Ironaton stack to-morrow, but will continue to operate at Gadsden. The general expression as to the outlook of the near future is optimistic.

Pig Iron.—The Southern iron masters accepted the lower price schedule with good grace, believing it the best possible solution of the problem and rejoicing in the stabilization which they think will ensue. One sale

on the new basis was made the day of announcement and a flood of inquiries was received both by iron and steel makers from melters. The market was already sagging. One concern, shortly before the new price list was announced, had sold several lots in competitive territory at \$28. A large maker of foundry iron says he will not sell at present price, but hopes that a regular buying movement will before long advance the market to a higher level. While costs were such as to render operations almost impossible, greater efficiency of men and better quality of material have reduced the costs. The head of one of the largest companies says: "Now that we know what to expect in the way of prices we will have to go to work and figure how we can make iron more cheaply. When the consumer feels that he is getting material at the lowest possible price, he will come into the market for his needs and buy liberally. With active buying, construction work resumed on a large scale and the demand ever increasing, the manufacturers will be able to charge such prices as will give them a fair profit." Several share the view that a real buying movement will tend to advance the market over the fixed minimum. Another cheering thing is the retention of the differentials. A leading maker, speaking of this, said: "With the retention of the silicon differentials, the average sales price of our Birmingham furnaces ought to be around \$2 above the base price." Southern furnaces have made more and more high silicon and will go out for that stronger still. There is no indication that any additional furnaces will blow out. Indeed, some of the Woodward Iron Co.'s idle stacks ought to be among the first to resume, as that company draws its raw material from its own mines and quarries by its own railroad equipment over its own lines and can make a profit if any Southern concern can. Resumption there, it is understood, hinges altogether on a buying movement. The Takladega stack has been blown out and will probably remain so. The Sheffield Iron Corporation banked fires on March 15. Neither action was incident to the new schedule. We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

Foundry, 1.75 to 2.25 silicon	\$26.75
Basic	25.75

Cast Iron Pipe.—The cast iron pipe market reached a high point of stagnation preceding the price conference owing to the practical certainty that prices would be marked down following action on pig iron. Pipe quotations will be revised at once and business is expected to pick up. The leading interest is making and piling some pipe, indicating that it expects business to open up. Sanitary shops barely keep going.

Coal and Coke.—The coal output is low owing to a let-up in the demand for steam coal and a number of coking plants have been put out of blast. There is more than enough furnace coke, but the output of good foundry is readily absorbed at \$9 for 72-hr. hand picked.

Old Material.—The scrap market has been as inactive as pig iron, because no one was buying during the 10 days preceding the price conference. Quotations have not been changed. We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers as follows:

Steel rails	\$10.50 to \$11.00
No. 1 heavy steel	10.00 to 10.50
Cast iron borings	6.00 to 6.50
Machine shop turnings	6.00 to 6.50
Stove plate	13.00 to 13.50
No. 1 cast	19.00 to 19.50
Car wheels	19.00 to 19.50
Tramcar wheels	18.00 to 18.50
Steel axles	28.00 to 30.00
No. 1 wrought	18.00 to 18.50

The Brown Hoisting Machinery Co., Cleveland, has taken an order for two bridges for handling ore and coal to be erected at Rio de Janeiro, Brazil, for the Campania Nacional de Navegacio Costeua. The bridges will have a span of 130 ft. and each will be equipped with an 80 cu. ft. ore bucket and a 230 cu. ft. coal handling bucket.

The Consolidated Steel Corporation has opened offices in London, England, at 139 Fenchurch Street, and Cecil M. Sanders has been appointed agent.

St. Louis

ST. LOUIS, March 24.

Pig Iron.—Consumers are not yet ready to buy at the new prices. They seem to regard the new figures as satisfactory, if they continue stable, but say they will have to take a loss on iron in yards or under contract unless existing contracts are readjusted to new prices. The market generally is still awaiting positive assurance of no further revision before taking any action. Most of the foundries are well supplied for immediate needs and some still have iron coming to them from the furnaces. The trade, however, is optimistic in tone and it is believed that the stabilization of prices will lead to new business. The stove interests are expected to feel the return of business shortly, particularly as the mail order houses which do much business on St. Louis product have not yet placed their contracts.

Coke.—Some few sales of coke at the established price were made during the week, one of 500 tons for early delivery being the most noteworthy. Melters are feeling out the market, but there have not been any very large inquiries and no transaction of moment other than the one noted.

Finished Iron and Steel.—The finished products market was advised promptly of the new base prices and the trade generally was at once notified, but the time so far has been too short to determine the effect. The mills have placed their prices at these figures: Bars, 2.35c.; structural material, 2.45c.; plates, 2.65c. Movement out of warehouse was checked pending the determination of the new prices, which were announced Saturday as follows:

Soft steel bars, 3.44c.; iron bars, 3.44c.; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets, 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gauge, 6.79c.

Old Material.—The scrap market was naturally affected by the conference on finished product and pig iron prices and there was, therefore, no business stirring during the week save a little speculative buying by dealers. Mills are out of the market for the moment, but the dealers are optimistic, generally believing that the reduced prices on pig iron and finished steel will result in greater business activity and in consequence more demand for scrap.

Per Gross Ton

Old iron rails	\$22.00 to \$23.00
Old steel rails, rerolling	16.00 to 17.00
Old steel rails, less than 3 ft.	16.50 to 17.00
Relaying rails, standard sections, subject to inspection	40.00 to 45.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	15.00 to 15.50
Heavy shoveling steel	14.00 to 14.50
Ordinary shoveling steel	13.00 to 13.50
Frogs, switches and guards, cut apart	15.00 to 15.50
Ordinary bundled sheets, scrap	9.00 to 9.50
Heavy axle and tire turnings	8.00 to 8.50

Per Net Ton

Iron angle bars	16.00 to 16.50
Steel angle bars	15.00 to 15.50
Iron car axles	24.00 to 24.50
Steel car axles	23.00 to 23.50
Wrought arch bars and transoms	19.00 to 19.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.00 to 14.50
Railroad springs	15.50 to 16.00
Steel couplers and knuckles	15.50 to 16.00
Locomotive tires, 42 in. and over, smooth inside	14.00 to 14.50
No. 1 dealers' forge	11.50 to 12.00
Cast iron borings	8.00 to 8.50
No. 1 busheling	13.50 to 14.00
No. 1 boilers cut to sheets and rings	8.00 to 8.50
No. 1 railroad cast	20.00 to 20.50
Stove plate and light cast	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Agricultural malleable	11.00 to 11.50
Pipes and flues	11.00 to 11.50
Heavy railroad sheet and tank	10.00 to 10.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	6.50 to 7.00
Country mixed	11.00 to 11.50
Uncut railroad mixed	12.50 to 13.00
Horseshoes	14.50 to 15.00

New York

NEW YORK, March 26.

Pig Iron.—The market is much confused on account of uncertainty as to methods of quoting. While the official announcement given out by the Industrial Board of the Department of Commerce states that basing points and differentials are unchanged, the former custom of basing Virginia iron on Birmingham and eastern Pennsylvania on Pittsburgh has not recently been in vogue in this section, and the few sales made have been on the basis of the furnace price plus freight to New York. It is not believed that it will be possible to maintain the double basing system which was adopted as an extraordinary expedient of war times. It is pointed out, for example, that Virginia iron selling on a Birmingham basis in Boston would be quoted \$4.10 higher than the delivered price of Buffalo iron. Competition by Virginia iron under such conditions would, of course, be impossible. It is expected that all question as to basing points will be settled by the pig iron producers themselves at the meeting in Pittsburgh Wednesday. Another subject that is causing a little anxiety is the prospect that buyers will ask for revision of contracts so far as undelivered tonnages are concerned. It is probable that some buyers will grant this concession and that others will not. The leading Virginia seller and also a prominent Alabama company have refused to revise contracts on tonnages undelivered Jan. 1, but other companies have granted the \$3 concession on old as well as new business. Recent inquiries for export have amounted to several hundred thousand tons, but almost no actual business has resulted. We quote prices as follows, delivered New York, for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25	\$31.55
No. 2 X, silicon, 2.25 to 2.75	29.75
No. 2 plain, silicon, 1.75 to 2.25	28.55
No. 2 X, Virginia, silicon, 2.25 to 2.75	32.40
No. 1 Southern, silicon, 2.75 to 3.25	37.45
No. 2 Southern, soft (all rail), sil., 2.25 to 2.75	34.70
No. 2 Southern (all rail), sil., 1.75 to 2.25	34.45

Ferroalloys.—Producers of ferromanganese have revised their quotations and are now asking \$150, delivered, for 80 per cent ferromanganese as compared with \$200 previously ruling. They have not thus far booked any business at this level, as demand continues very light, most consumers being apparently well stocked for some time to come. There continues to be the sporadic hand-to-mouth buying, most of it of resale material, at levels below the producers' quotation. An interesting fact is that fairly large quantities of British ferromanganese are now being received on old contracts made before this country entered the war. The prices involved in this material range from quite low levels to around \$164, seaboard, the majority of it probably at the higher levels. It is not possible, however, yet to make new contracts for the British alloy. There has been more inquiry than in some time for ferromanganese for export, and one dealer has made a sale of several hundred tons, but the price involved is not revealed. Most of this demand comes from Italy. There is some difference of opinion as to whether American producers can compete with the British ferromanganese makers, some contending that this is possible, while others say that the recent reduction in the British export price to £30, which is equivalent to about \$141, eliminates the American product. It is recognized, however, that British costs are very much higher than before the war, and this is cited as increasing the possibility of American competition. The spiegeleisen market is inactive and quoted nominal at \$40 to \$45, furnace, depending on the analysis and the delivery. Some export inquiry for this material has also appeared, but no sales are reported. There have been no developments in the 50 per cent ferro-silicon market and definite quotations are unobtainable. It is probable that the alloy, either as resale material or on contract, can be obtained anywhere from \$90 to \$120 per ton, delivered, depending upon the seller and the quantity as well as the deliveries desired.

Cast Iron Pipe.—Although cast iron pipe manufacturers in the East have not yet taken any action in regard to prices, it is expected that they will reduce quotation \$5 per ton to-morrow in harmony

with the action taken by shops in the Central West. On the 450 tons for the Passaic Valley Sewerage Commission, Newark, N. J., bids were as follows: R. D. Wood & Co., \$63.19 per ton; United States Cast Iron Pipe & Foundry Co., \$61.74; Warren Foundry & Machine Co., \$61.25; Camden Iron Works, \$58.40. The contract was awarded to the Camden Iron Works. As the bidding was on various sizes it was impossible to make comparison with recent quotations. New York quotations, which, it is expected, will be reduced \$5 per ton to-morrow, are as follows for 6-in. and heavier, \$62.70, New York; for 4-in., \$65.70; for 3-in., \$72.70, and \$1 additional for class A and gas pipe.

Finished Iron and Steel.—Not enough time had elapsed at this writing to ascertain the effect of the cut in prices. In some lines a considerable amount of bookings were made on Monday, but practically all cases represented material for immediate needs held back a few weeks to take advantage of the expected lower prices. Practically all business was suspended in New York on Tuesday owing to a local celebration in honor of the return of troops made up largely from New York City and State. Some of the steel companies have decided to apply the new prices on all shipments from March 20 on. The only noteworthy possibility of early Government purchases appears to lie in some six floating drydocks, each requiring about 2000 tons of plates and shapes, regarded as a necessity by the Emergency Fleet Corporation. In the building field the largest enterprise is a 12-story additional building for the Pictorial Review on West Thirty-ninth Street, taking 3000 tons, and now under active negotiations. The Bethlehem Steel Bridge Corporation has contracted for a 600-ton highway bridge at Falls, Pa., and the Pennsylvania Railroad has entered the market for 250 tons of bridge work. It appears that about 8000 tons of plate work for tanks for the Standard Oil Co. was the amount placed with the Riter-Conley Mfg. Co., and that about 5200 tons are yet to be put under contract. There is general belief in the trade that these plates will be furnished on an existing contract at which the plates are to be supplied at 2.50c. Pittsburgh, or even less, but this is conjecture; incidentally it is recognized that from mill standpoint as supplying a good backlog the business is desirable even at the unconfirmed prices. The Jersey City riveted pipe line may be narrowed down to very few plate mills, as at least one of the contractors is figuring on 116-in. plates, so that for the 72-in. line there will be only two longitudinal joints. The new steel prices represent a reduction of \$7 per ton, as noted elsewhere in this issue, and are as follows for mill shipments: Steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c., all New York.

Warehouse Business.—A new spread of \$15 a ton, which has been established by the leading steel interest between mill and warehouse prices, has been generally adopted by jobbers. This 25 per cent reduction of the margin for retailing went into effect Monday, March 24. Reports current last Friday and Saturday that a 40 per cent cut was to be made, caused considerable uneasiness; and is said to have led to the smaller reduction finally arrived at. Since the establishment of so-called Government control, jobbers' prices have been 1c. per lb. higher than mill prices, and coincident with the \$7 per ton cut in mill shipments it was proposed to reduce warehouse shipments \$8 per ton additional. This would have made the warehouse-mill differential \$12 per ton instead of the finally adopted \$15 differential and warehouse prices are thus mostly \$12 per ton lower than last week. There is no unanimity of opinion that the new Washington schedule of prices will guarantee an early buying movement; but greater activity is looked for, and a maximum of benefit is expected to result from the tendency toward stabilizing of prices. The mills are still shipping in considerable stock to warehouses at prices above the new schedule; while going business is piecemeal in character and only for immediate needs. One local jobbing house, which had orders on the books of a large steel mill, ranging from 1.75c. to 3.50c., is reported to have compromised for 2.50c. per lb. on a large tonnage. Nonferrous metals are practically unchanged over last week. We quote out-of-store prices: No. 28 box annealed black sheets,

cold rolled, one pass, at 5.50c.; No. 28 galvanized sheets, 6.50c.; steel bars, 3.37c.; structural shapes, 3.47c.; plates, 3.67c.; No. 10 blue annealed sheets, 4.55c.; bands, 3/16 in., Nos. 10 and 12, 4.07c.; shafting, plus 9 per cent of list.

Old Material.—Now that pig iron has been assigned a definite value which is expected to hold the rest of the year, the scrap trade seems confident that old material will rise in order to meet more closely this newly established price. Accordingly, a slight advance in several items has occurred during the past week. For the first time in a considerable period activity has been resumed in old rails for rerolling and relaying purposes. Prices which brokers are quoting dealers, New York, follow:

Heavy melting steel.....	\$11.50 to \$12.00
Rerolling rails	14.00 to 15.00
Rerolling rails, nominal	43.00 to 45.00
Iron and steel car axles.....	19.00 to 21.00
No. 1 railroad wrought.....	18.50 to 19.50
Wrought-iron track	13.00 to 14.00
Forge fire	8.50 to 9.50
No. 1 yard wrought, long.....	15.00 to 16.00
Light iron	5.50 to 6.50
Cast borings (clean).....	10.00 to 10.50
Machine shop turnings.....	8.50 to 9.50
Mixed borings and turnings.....	7.50 to 8.50
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long....	13.00 to 14.00
Stove plate	16.00 to 17.00
Locomotive grate bars.....	14.00 to 15.00
Malleable cast (railroad).....	13.50 to 14.50
Old carwheels	21.00 to 21.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast.....	\$22.50 to \$23.50
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	21.00 to 22.00
No. 1 heavy cast, not cupola size.....	15.00 to 16.00
No. 2 cast radiators, cast boilers, etc.	16.50 to 17.50

British Iron and Steel Market

Coal Crisis Serious—Pig Iron Exports Virtually Stopped—Higher Steel Prices Asked For
(By Cable)

LONDON, ENGLAND, March 25.

The uncertainty regarding a settlement of the coal crisis is causing considerable uneasiness. Export business in pig iron has practically stopped. Domestic supplies are inadequate and neutral nations are canceling orders. Allocations of steel sheet bars to the tin-plate trade will be canceled at the end of this month and an open market restored. The proposal for a central tin-plate selling agency is being received favorably and it is agreed, owing to expected competition especially from America, that plans for its formation be inaugurated.

Steel makers are applying to the Ministry of Munitions for permission to increase prices on steel from April 1 owing to advancing costs.

The Lorain Steel Co. of Ohio has sold 1000 tons of girder rails to the Birmingham Corporation at £16 15s. (\$77.90) for April delivery. The United States is reported to have sold 10,000 tons of tin-plate bars to Wales, but this report is unconfirmed.

Vickers, Ltd., is amalgamating with the Metropolitan Carriage Co., with a capital of £26,500,000.

Following are the government fixed prices for steel per gross ton except where otherwise stated, f.o.b. makers' works, the figures in brackets being the official domestic prices and the others the official export prices:

Hematite pig iron: East Coast, £8 12s. 6d. (\$41) [£6 2s. 6d.]; West Coast, £8 17s. 6d. (\$42.20) [£6 7s. 6d.].
Ship, bridge and tank plates, £16 10s. (\$78.45) [£14].
Roller plates, £17 10s. (\$83.21) [£15].
Ship, bridge and tank plates, thin, £19 10s. (\$92.72) [£16].
Small angles, tees and flats, £20. (\$95.10) [£16 10s.].
Beams, £16 2s. 6d. (\$76.68) [£13 12s. 6d.].
Rails, 60 lb. per yd. and upward, £15 10s. (\$73.70) [£13 7s. 6d.].
Rounds, squares and hexagons, £17 10s. (\$83.21) [£14 5s.].
Billets and slabs for rolling, £13 10s. (\$64.19) [£12 5s.].
Billets and slabs for forging, £15 (\$71.32) [£12 15s.].
Bar iron, £20 (\$95.10).
Tin plate, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 40s. to neutral countries; otherwise, 33s. 3d. (\$7.90) [32s. 10½d.].
Tin plate bars [£12 5s. 2d.].
Galvanized sheets, £28 10s. (\$135.52), domestic price.
Ferromanganese, £30 (\$142.65) [£25].

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, \$1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zebs, structural sizes, 2.45c.

Wire Products

Wire nails, \$3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.00; galvanized wire, \$3.60; galvanized barbed wire and fence staples, \$4.10; painted barbed wire, \$3.40; polished fence staples, \$3.40; cement-coated nails, \$2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

[Nominal; will probably be revised late this week.]

Large structural and ship rivets, \$4.20 base
Large boiler rivets, \$4.30
7/16 in. x 6 in. smaller and shorter rivets, .60 per cent off list
Machine bolts h.p. nuts, ¾ in. x 4 in.:
Smaller and shorter, rolled threads, .50-10-5 per cent off list
Cut threads, .50-5 per cent off list
Larger and longer sizes, .40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ¾ in. x 4 in.:
Smaller and shorter, .40-10 per cent off list
Larger and longer, .35-5 per cent off list
Carriage bolts, ¾ x 6 in.:
Smaller and shorter, rolled threads, .50-5 per cent off list
Cut threads, .40-10-5 per cent off list
Larger and longer sizes, .40 per cent off list
Lag bolts, .50-10 per cent off list
Flow bolts, Nos. 1, 2, 3, .50 per cent off list
Hot pressed nuts, sq. blank, 2.50c. per lb. off list
Hot pressed nuts, hex., blank, 2.30c. per lb. off list
Hot pressed nuts, sq., tapped, 2.30c. per lb. off list
Hot pressed nuts, hex., tapped, 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank, 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped, 2.00c. per lb. off list
Semi-finished hex. nuts:
¾ in. and larger, .60-10-10 per cent off list
9/16 in. and smaller, .70-5 per cent off list
Stove bolts, .70-10 per cent off list
Stove bolts, 2½ per cent extra for bulk
Tire bolts, .50-10-5 per cent off list
The above discounts are from present lists now in effect.
All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52; chain rods, \$60; screw, rivet and bolt rods and other rods of that character, \$60. Prices on high carbon rods are irregular. They range from \$65 to \$75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, per 100 lb., \$3.30, in lots of 200 kegs of 200 lb. each, or more; track bolts, \$4.55. Boat spikes, \$4.75 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., \$13.80 per package; 8-lb. coating, I. C., \$14.10; 12-lb. coating, I. C., \$15.80; 15-lb. coating, I. C., \$16.80; 20-lb. coating, I. C., \$18.05; 25-lb. coating, I. C., \$19.30; 30-lb. coating, I. C., \$20.30; 35-lb. coating, I. C., \$21.30; 40-lb. coating, I. C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35 from mill. Prices on bar iron not agreed upon, but will be in a few days.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
1½, 1¼ and ¾	50½	24	¾ and ¾	29	4½
1½	54½	40	¾	30	5½
¾ to 3	57½	44	¾ to 1½	34	16½
				39	23½
Lap Weld			Lap Weld		
2	50½	38	1¼	24½	9½
2½ to 6	53½	41	1½	31½	17½
7 to 12	50½	37	2	32½	18½
13 and 14	41	..	2½ to 6	34½	21½
15	38½	..	7 to 12	31½	18½
Butt Weld, extra strong, plain ends			Butt Weld, extra strong, plain ends		
1½, 1¼ and ¾	46½	29	1½, 1¼ and ¾	28½	11½
1½	51½	39	¾	33½	20½
¾ to 1½	55½	43	¾ to 1½	39½	24½
2 to 3	56½	44			
Lap Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends		
2	48½	37	1¼	25½	10½
2½ to 4	51½	40	1½	31½	17½
4½ to 6	50½	39	2	33½	20½
7 to 8	46½	33	2½ to 4	35½	22½
9 to 12	41½	28	4½ to 6	34½	14½
			7 to 8	26½	9½
			9 to 12	21½	..

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel	Charcoal Iron
3½ to 4½ in. 40½	3½ to 4½ in. 15½
2½ to 3½ in. 30½	3 to 3½ in. 5½
2½ in. 24	2½ to 2¾ in. 8
1¾ to 2 in. 19½	2 to 2½ in. 23
	1¾ to 1¾ in. 25½

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton	Per Net Ton
1 in. \$327	1¼ in. 207
1¼ in. 267	2 to 2½ in. 177
1½ in. 257	2½ to 3¼ in. 167
1½ in. 207	4 in. 187
	4½ to 5 in. 207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer	Cents per lb.
Nos. 8 and heavier	3.50
Nos. 9 and 10 (base)	3.55
Nos. 11 and 12	3.60
Nos. 13 and 14	3.65
Nos. 15 and 16	3.75
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.15
Nos. 22 and 24	4.20
Nos. 25 and 26	4.25
No. 27	4.30
No. 28 (base)	4.35
No. 29	4.45
No. 30	4.55
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	4.70
Nos. 12 and 14	4.80
Nos. 15 and 16	4.95
Nos. 17 to 21	5.10
Nos. 22 and 24	5.25
Nos. 25 and 26	5.40
No. 27	5.55
No. 28 (base)	5.70
No. 29	5.95
No. 30	6.20
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.15
Nos. 17 to 21	4.20
Nos. 22 to 24	4.25
Nos. 25 to 27	4.30
No. 28 (base)	4.35
No. 29	4.40
No. 30	4.40
Nos. 30½ and 31	4.45

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery							
Copper, New York		Tin, New York		Lead		Spelter	
Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis	
19	15.12½	14.87½	72.50	5.22½	4.95	6.47½	6.12½
20	15.25	15.00	72.50	5.20	4.95	6.47½	6.12½
21	15.25	15.00	72.50	5.20	4.95	6.50	6.15
22	15.25	15.00	72.50	5.20	4.95	6.50	6.15
23	15.37½	15.12½	72.50	5.20	4.95	6.52½	6.17½

NEW YORK, March 25.

The markets are generally inactive, but the tone is firmer in some of them. Copper is in better demand and higher. Tin continues stagnant and devoid of any feature. Lead has eased off to slightly lower levels. Spelter is firmer on the expectation of better buying soon. Antimony is lower and quiet. Tuesday, March 25, was a holiday in New York.

New York

Copper.—A better inquiry than in the last few weeks developed late last week and on Monday of this week which resulted in considerable buying, as judged by present market standards. Estimates of the quantity sold on this movement range from 35,000,000 lb. to 175,000,000 lb., which, at the lowest figure, would be more than in January or February, but this is unconfirmed. As a result quotations are higher, with electrolytic held at 15.12½c. to 15.25c., New York, and Lake nominal at 15.37½c., to 15.50c., New York. There is no demand yet from foreign markets. The New York Metal Exchange will inaugurate trading in copper on March 31 next. The rules have been revised to meet new conditions and also to meet the demand of an active metal exchange. The aim has been to make the rules of such a nature that they will be mutually satisfactory to all concerned.

Tin.—The tin market continues slow. There has, however, been an interesting development. Those in control of the tin market, which still labors under Government restrictions, have prevented a large American smelting company from selling American tin in less than 5-ton lots, this having been permitted unrestrictedly until now. This is regarded as only another move to prevent competition with the allocated tin and to assist in hastening its absorption. The main interest of the general market centers in how fast this allocated tin is being absorbed, but no statement regarding this is available. The last estimate placed it at 6000 tons sold of the 10,000 tons allocated. The fall in sterling exchange has affected costs of tin imports, but as these are not permitted now the depreciation is a matter more of interest than anything else. American tin, 99 per cent., is obtainable at about 68c., New York, with spot Straits unchanged at 72.50c., New York. Tin arrivals thus far in March have been 1425 tons, all at Pacific ports, no increase over those reported a week ago. Spot Straits was quoted in London yesterday at £239 per ton, no change from last week.

Lead.—The market continues very quiet. The dullness is reflected in a slight easing of prices to 5.20c., New York, or 4.95c., St. Louis. This decline has been caused by certain sellers becoming restless and attempting to tempt consumers. The latter, however, have so far refused to be enticed into buying. The condition of the market as a whole is regarded as sound fundamentally. It is evident that lead will not be purchased extensively until other raw materials are cheaper. The quotation of the leading interest is unchanged at 5.25c., New York, or 5c., St. Louis.

Spelter.—The market is quiet, but firmer, with prime Western now quoted at 6.17½c. to 6.20c., St. Louis, or 6.52½c. to 6.55c., New York. This is due not to increased demand nor buying, but to a revision of the plans of selling interests. The lowering of the prices of steel is expected to enable galvanizers to enter the market for steel sheet bars and therefore to quicken the

demand for spelter. This is apparently the main reason back of the firmer tone of the market.

Antimony.—Dullness pervades the market and quotations are lower and largely nominal at 6.25c. to 6.37½c., New York, duty paid, for wholesale lots for spot delivery.

Aluminum.—The market is quiet, with No. 1 virgin metal, 98 to 99 per cent pure, quoted at 29c. to 31c., New York, for early delivery.

Old Metals.—The market is quiet, but there seems to be a better undertone. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	15.50
Copper, heavy and wire	14.50
Copper, light and bottoms	12.25
Brass, heavy	11.25
Brass, light	7.50
Heavy machine composition	15.00
No. 1 yellow rod brass turnings	8.25
No. 1 red brass or composition turnings	12.00
Lead, heavy	4.75
Lead, tea	4.00
Zinc	5.25

St. Louis

ST. LOUIS, March 24.—Non-ferrous metals markets have been quiet, with lead quoted in car lots at 5c. and spelter at 6c. to 6.10c. In less than car lots lead is quoted at 5.25c.; spelter, 6.50 c. to 6.75c.; tin, Government price, 72.50c.; copper, 16 to 17c.; Asiatic antimony, 8c. In the Joplin district the tone of the ore market has not been strong and the range showed no improvement over the preceding week, but rather the reverse. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 6c.; heavy yellow brass, 8.50c.; heavy red brass, 12c.; light copper, 10c.; heavy copper and copper wire, 12c.; zinc, 3c.; lead, 4c.; tea lead, 3c.; pewter, 35c.; tinfoil, 40c.

Chicago

CHICAGO, March 25.—Copper has been active and the market shows considerable strength. Tin has followed a routine course, but presents some puzzling and disturbing features. A current, but unconfirmed rumor, has it that selling is to be confined to the United States Steel Products Co. This is not accepted, as holders of tin say they surely have a right to sell the metal they have in stock. Selling of futures, contingent on the Government regulations being abandoned, may be one alternative. The official tin committee says in a circular that the regulation of distribution will not cease on that date. Lead and spelter are quiet. Antimony has been fairly active. We quote copper at 16c. to 16.50c. for carloads; tin, 72.50c.; lead, 5c.; spelter, 6.25c.; antimony, 8c. to 8.50c. On old metals we quote copper wire, crucible shapes, 12.50c.; copper clips, 12c.; copper bottoms, 10.50c.; red brass, 12.50c.; yellow brass, 8c.; lead pipe, 3.50c.; zinc, 4c.; pewter, No. 1, 32c.; tinfoil, 37c., and block tin, 50c., all these being buying prices for less than carload lots.

Making 50 Per Cent Ferrosilicon in a Blast Furnace

J. E. Johnson, Jr., claims in a patent (U. S. 14,547, reissued Nov. 12, 1918) that, by enriching the blast of a blast furnace with oxygen up to 50 per cent oxygen, not only will it be possible thus to reduce the cost of making the lower grade (10 to 12 per cent) ferrosilicon, but that also the temperature focus obtainable with enriched air will be high enough so that much larger amounts of silica will be reduced and a 50 per cent ferrosilicon result at a lower cost. Mr. Johnson bases his claim on the fact that the calorific intensity varies approximately inversely as the products of combustion and that the large amounts of nitrogen in atmospheric air lower the maximum temperature in a blast furnace to a point where a 12 per cent ferrosilicon is the ordinary alloy made.

A bronze watch fob, the face a reproduction of the seal of the United States of America, has been issued for complimentary distribution by L. S. Grammes & Sons, Allentown, Pa.

PERSONAL

L. E. Thomas, recently elected president of the Reading Iron Co., Reading, Pa., as announced in THE IRON AGE last week, was born in Pittsburgh, March 27, 1877,



L. E. THOMAS

graduated in the mechanical engineering course, Pennsylvania State College, class of '98, and received the degree of mechanical engineering several years later. After a short time with Mackintosh, Hemphill & Co., Pittsburgh, he entered the engineering department of the Ohio Steel Co., at Youngstown, now the Ohio works of the Carnegie Steel Co. At the time of leaving the Ohio works in 1902, he was assistant master mechanic. He had taken part in the construction of the first two blast furnaces built at that plant. He left the Carnegie Steel Co. to become superintendent of the Youngstown plant of the United Engineering & Foundry Co., and after a year was transferred to the general office at Pittsburgh, where he remained until 1905. During this period, he acted as consulting engineer for the Republic Iron & Steel Co., in construction of a rail and sheet bar mill at Youngstown. In 1905 he became general manager of the Birdsboro Steel Foundry & Machine Co., and in 1916 was made vice-president and general manager, which position he held until he resigned, to become president of the Reading Iron Co. Mr. Thomas comes from a family long identified with the iron and steel industry. His father, who died in 1896, was the owner of a roll shop in Pittsburgh, where he designed and finished rolls for the principal iron and steel mills of the country at that time.

Frank C. Smink, who has just retired from the office of president of the Reading Iron Co., a position he has held since 1902, has been elected chairman of the board of directors in place of Edward T. Stotesbury. When Mr. Smink became president 17 years ago, he succeeded the late George F. Baer, when the latter was elected president of the Reading Railroad. He was born in Kutztown, Pa., in 1845, entered the employ of the Reading Railway Co. in 1864 as secretary to the superintendent, and later resigned to accept a bank clerkship. Meantime he had also become treasurer of the Berks & Lehigh Railroad Co. When this company suspended business in 1877, he became business manager of the Reading Iron Works. After the failure of the works, he helped form the Reading Iron Co., becoming vice-president and general manager under Mr. Baer. Mr. Smink was also a director and member of the executive committee of the Pennsylvania Steel Co., and was a director of the Spanish-American Iron Co., the Maryland Steel Co., and the Temple Iron Co.

W. H. Cameron, general manager National Safety Council, Chicago, has resigned to become manager of industrial relations for the Eastman Kodak Co., Rochester, N. Y. He is succeeded by C. W. Price, for the past two and a half years field secretary for the council, prior to which he was director of safety survey of arsenals and navy yards for the United States Employment Compensation Commission. Sidney J. Williams, formerly manager of the accident prevention division, has been appointed secretary, and F. W. Pardee, previously business manager, treasurer.

The Hudson Motor Specialties Co., Philadelphia, recently made several changes in its official force. Raymond Hawley continues as treasurer and executive manager. Other duties in connection with the sales and advertising, formerly within his jurisdiction, are now

being handled by Vice-President J. H. Malone. Mr. Hawley is thereby enabled to devote a larger part of his time to the Precision & Thread Grinding Mfg. Co., and the Hudson Motor Axle Co. Ernest George has been appointed assistant secretary and assistant treasurer, and B. Reyes Noyola cashier of the Hudson Motor Specialties Co.

Lemuel C. Biglow, formerly New York manager for the Morse Chain Co., Ithaca, N. Y., has been appointed manager of the Eastern office of the W. A. Jones Foundry & Machine Co., 30 Church Street.

E. W. Snyder, for many years with J. B. Sipe & Co., is now with the Hilo Varnish Corporation. He will make his headquarters in Pittsburgh, and serve the trade in western Pennsylvania, eastern Ohio and northern West Virginia.

Grant J. Woolston, formerly of the Fulton Steel Corporation, is now associated with the Aborn Steel Co., 22 Clarke Street, New York.

E. R. Yarnelle, formerly vice-president of the American Horse Shoe Co., Phillipsburg, N. J., has been elected president in place of Philip S. Dyer, who died recently.

After 24 years' continuous service, George W. Hughes has resigned as general superintendent for Joseph E. Thropp, Everett, Pa., manufacturer of pig iron, effective March 31, and has accepted the position of blast furnace superintendent at the Monessen plant of the Pittsburgh Steel Co.

Gen. Guy E. Tripp, chairman Westinghouse Electric & Mfg. Co., has been decorated with the United States Government distinguished war service medal, which was awarded him for his excellent work in systematizing methods and practice, resulting in the hearty co-operation of industries producing ordnance material for the army. Mr. Tripp's army career has been marked by a series of successes. Entering the army with the rank of colonel as chief of the production division of the ordnance department, he was promoted to the rank of brigadier general as assistant chief of ordnance. He conceived the idea that production work of the ordnance department should be handled from different points in the United States instead of through one head in Washington. General Tripp has again assumed his duties as chairman of the board of directors.

Capt. A. C. Nell, who, for the period of the war has been in charge of the purchase of power and mechanical equipment in the construction division of the Army, has been released from active duty, and has been appointed Chicago district manager for the Lea-Courtenay Co. and the Schutte & Koerting Co., with offices at 1466 Conway Building, Chicago. Mr. Nell was formerly connected with the Allis-Chalmers Mfg. Co.

Frank A. Cabeen, Jr., for many years with the Philadelphia office of Rogers, Brown & Co., and recently associated with the Matlack Coal & Iron Corporation, has opened an office in the Real Estate Trust Building, Philadelphia. He will handle iron and steel products, fire brick, fire clays, and kindred lines.

Capt. E. L. Stapleton, who has had charge of the graphic charts branch for the gas defense division, C.W.S., has been discharged from the Army and is now with Willard C. Brinton, consulting engineer, New York.

Neil D. Jackson has recently become export manager with Herbert Crapster, 1 Madison Avenue, New York, distributor of Cummings' gasoline locomotives and railway and industrial equipment. Mr. Jackson recently received his discharge from the Army, having served for 17 months as captain, Q.M.C., stationed in New York.

George W. Frantzen, 17 Battery Place, New York, has been appointed export manager of the Reading Chain Block Works, Reading, Pa.

Charles H. Hutchins, chairman of the board of directors, Crompton & Knowles Loom Works, Worcester, Mass., has been elected a director of the Booth Mfg. Co., New Bedford, Mass.

L. J. Chandler was elected president of the Springfield branch of the Metal Trades Association, Springfield, Mass., at the annual meeting, March 18. The following officers were also elected: Charles E. Van Norman, vice-president; A. D. Scott, treasurer; A. R.

Tullock, secretary. The executive board also includes F. F. Storms, A. H. Burgess and C. V. Derrick. Retiring President G. W. Kyburg was elected to the advisory board.

C. W. Price, who for the past two and a half years has been field secretary of the National Safety Council, has been elected general manager, to succeed W. H. Cameron, resigned, to become manager of industrial relations for the Eastman Kodak Co. At the same time Sidney J. Williams, manager of the accident prevention division of the Council, has been elected secretary, and F. W. Pardee, business manager, was elected treasurer to succeed Mr. Cameron in those positions. Mr. Price was for 12 years with the International Harvester Co., during the last four years of which he was in charge of safety work for all the company's plants. For a period of five years he was assistant to the chairman of the Wisconsin Industrial Commission, in which capacity he worked out standards for safety and sanitation, conducted educational safety campaigns in large industrial centers and organized safety work in the larger plants in Wisconsin. During the summer of 1917 he acted as director of the safety survey made by the United States Employment Compensation Commission of all arsenals and navy yards. As general manager, he will have his headquarters at Chicago.

W. H. Diefendorf, Syracuse, N. Y., has resigned as chief engineer and as a director of the New Process Gear Corporation and is now with the Weeks-Hoffman Co. of the same city.

F. R. Still, vice-president and secretary American Blower Co., Detroit, has left on an extended trip for the Far East, where he will investigate trade conditions in connection with export work. His itinerary includes Japan, China, Australia and most of the European countries, and he expects to cover approximately 36,000 miles before returning home about Nov. 1.

C. Harold Wills, for the last 18 years with the Ford Motor Co. and one of the designers of the various models of Ford cars which have been turned out during that time, has resigned to enter business for himself. Mr. Wills designed much of the special machinery and equipment now in use in the Ford plant, together with the original processes of volume production.

Howard E. Coffin, vice-president Hudson Motor Car Co., Detroit, is in Europe studying aviation and motor engineering.

John R. Lee, for eight years one of the active and prominent figures in the development of the Ford Motor Co., particularly in the participation of the Ford interests in war work, has resigned.

Lieut.-Col. L. J. Campbell, a vice-president of the Youngstown Sheet & Tube Co., Youngstown, Ohio, who recently returned from active service in France, has gone to Florida for a rest. Colonel Campbell was gassed, but is recovering rapidly.

J. E. Daily has resigned as general superintendent of the open-hearth steel plant of the Sharon Steel Hoop Co. at Lowellville, Ohio, on account of ill health.

President James A. Campbell of the Youngstown Sheet & Tube Co., Youngstown, Ohio, with Mrs. Campbell, is in Hot Springs, Ark., taking a rest.

Clifford K. Simonds, general manager Simonds Mfg. Co., Fitchburg, Mass., has been added to the board of directors of the First National Bank of Boston.

Ernest T. Gregory, formerly representative of the American International Corporation and manager of the International Banking Corporation, Pekin, China, has been elected vice-president of the First National Corporation of Boston. Mr. Gregory at one time was connected with Lee, Higginson & Co. and later was a partner in the firm of Hambleton & Co., Baltimore.

I. J. Peat will become superintendent of the Marine Equipment Co., Mobile, Ala., April 1.

To study trade conditions and look over the prospects for business development, James A. Emmons, vice-president the Quaker City Corporation, manufacturer, exporter and importer, Philadelphia, left for Havana, Cuba, March 22. Mr. Emmons will make the trip with Albert M. Hogg of the Corn Exchange Na-

tional Bank of Philadelphia and plans to be gone about three weeks.

Nathan Lester has accepted the position as superintendent of the Acme Die-Casting Corporation, Brooklyn, N. Y.

Joseph L. Blair has been elected assistant treasurer of the Niles Tool Works Co., Hamilton, Ohio, succeeding the late Lucius B. Potter. Mr. Blair will continue as secretary of the company, which position he has held several years.

S. G. Pierson, vice-president and general purchasing agent Colorado Fuel & Iron Co., Denver, has been elected treasurer of the company. J. B. Marks, now assistant purchasing agent, succeeds Mr. Pierson as purchasing agent. Mr. Pierson has been with the Colorado Fuel & Iron Co. since its organization.

The Elliott-Fisher Co., Harrisburg, announces that George Walter Spahr, formerly sales manager of the Tabulating Machine Co., New York, has been appointed sales manager of the Elliott-Fisher Co.

The International Boiler Works Co., East Stroudsburg, Pa., announces that Frank B. Metcalf, formerly assistant purchasing agent of the Baldwin Locomotive Works, has been elected a director and vice-president of the company and will assist Charles R. Turn, treasurer and general manager, in the conduct and operation of the company's business.

F. S. Healey has been appointed manager of sales of the Epping Carpenter Pump Co., Pittsburgh, succeeding F. F. Woods, who has been placed in New York as Eastern sales manager. Mr. Healey continues to hold the office of chief engineer. Albert A. Scheuch of the sales department has been appointed assistant sales manager, and Paul D. Goodman, formerly of the McCauley-Jemison Machinery Co., Birmingham, Ala., has been added to the sales personnel.

Hudson Motor Specialties Co., Philadelphia, has appointed the following New England representatives: R. L. Gilroy, F. T. Bachman and Joseph E. Simpson.

Walter R. Ingalls, who has been editor of the *Engineering and Mining Journal* for nearly 14 years, has retired and will re-enter professional practice as consulting engineer. Although he will open an office of his own at 115 Broadway, he will not sever his connection with the *Journal*, but will continue to act as consulting editor. H. C. Parmelee becomes acting editor, without relinquishing the editorship of *Chemical and Metallurgical Engineering*.

Lawrence W. Enos, until March a first lieutenant in the Quartermaster's Corps, is entering the organization of the Firestone Steel Products Co., Akron, Ohio, as manufacturers' representative in the Detroit district.

H. Sanborn Smith, vice-president Gulf States Steel Co., sails this week for London.

Improvement at Youngstown

YOUNGSTOWN, OHIO, March 25—(By Wire).—Adjustment of iron and steel prices was immediately reflected this week throughout the Youngstown district by an improvement in finishing mill schedules. Nine hundred additional men went to work in the plants of the Brier Hill Steel Co., this number being required to fully man departments that have not been running in full. Better operations indicate a determination by officials to discount new orders under the price reductions. The plate mill at Lansingville of the Republic Iron & Steel Co. resumed Wednesday. Other Republic departments are operating about 50 per cent. Only six of 14 open-hearth furnaces are in commission.

Schedules at the Sharon Steel Hoop Co. are 50 per cent of normal. At the plant of the A. M. Byers Co. the 12-in. bar mill, idle for several weeks, started on single turn this week.

Puddlers who have been working three heats to the turn commenced Monday on an 8-hr. day heat schedule. Operations slowed down at the Youngstown Sheet & Tube Co.'s works, with many finishing mills idle. The puddle mill is running after an idle spell.

OBITUARY

Leonard C. Hanna

Leonard C. Hanna, long identified with the iron ore, pig iron, coal and Lake transportation interests of the Central West as a member of the firm of M. A. Hanna & Co., Cleveland, of which his brother, the late Senator M. A. Hanna was the founder and head, died March 21, aged 68 years. He had been in poor health for several years, but the end came suddenly, as his condition did not become serious until the day before he died. Mr. Hanna was born in New Lisbon, Ohio, Nov. 30, 1850, his parents moving to Cleveland when he was a small boy. He was educated in the Cleveland public schools



LEONARD C. HANNA

and at Holbrook Academy, Ossining, N. Y. After leaving school, he served for a time as purser on a passenger steamer between Cleveland and Duluth. M. A. Hanna had become a member of the firm of Rhodes & Co., Cleveland, and L. C. Hanna was offered an opportunity to become associated with that firm, but instead went into the coal business in St. Paul, where he was associated from 1872 to 1874 with E. M. Saunders, formerly president of the Northwestern Fuel Co. In 1875 he returned to Cleveland and became connected with his brother's firm, which had changed its name to M. A. Hanna & Co., and in 1879 was admitted as a partner in this firm and took charge of its iron ore and vessel business. When M. A. Hanna became prominent in national affairs, L. C. Hanna became the active head of the firm and continued in this capacity many years. When the Lake Superior Iron Ore Association was organized he was an active member and later was president of the association for nine years, until succeeded by W. G. Mather. Under his direction, M. A. Hanna & Co. became the owners of one of the largest fleets on the Great Lakes, including the first steel vessels operated on the Lakes. After being a member of the firm for over 25 years he retired in 1905, but again became a partner in 1915. In addition to his other duties, he was president of the Claire Furnace Co., for many years a Hanna interest, and director and for a number

of years a member of the executive committee of the Republic Iron & Steel Co. He was also a director of the Great Lakes Towing Co., Kelley Island Line & Transport Co., the Cleveland Railway Co. and of other companies. He resigned his offices in these companies when he retired in 1905, with the exception of his directorships in the Kelley Island company and the Cleveland Railway Co., which he held until his death. Mr. Hanna was one of the directors of the Johnson Steel Co., Lorain, Ohio, now a part of the National Tube Co.

Mr. Hanna was married in 1876, and following the death of his wife a few years later was again married in 1888. He leaves two daughters by his first marriage, and one son, L. C. Hanna, Jr., by his second marriage. The latter is now a member of the firm. His brother, H. M. Hanna, and H. M. Hanna, Jr., are also members of the firm.

Mr. Hanna was one of the outstanding figures of the iron business of the Central West for many years. He was a man of strong character and commanding influence, wise in counsel and progressive in action.

JOHN A. HOCK, general manager Continental works of the National Tube Co., Pittsburgh, died at his home in the East End of that city, March 18, after an illness of six weeks. Mr. Hock was born in Reading, Pa., and first became connected with the National Tube Co. at Chester, Pa., in 1879. He remained there until 1900, when he superintended the building of the plant of the South Chester Tube & Pipe Co., with which he was connected for a short time. He returned to the National Tube Co. in 1902, going to Youngstown, Ohio, and in 1904 returned to Pittsburgh as general manager of the Continental works. He is survived by his widow, three daughters and one son.

HARRY DREW EGBERT, since 1912 engineer with the Research Corporation, 63 Wall Street, New York, died March 23 at his home at 626 Lenox Avenue, Westfield, N. J., after an illness of less than a week of pneumonia. He was the son of Prof. James C. Egbert of Columbia University from which institution he was graduated in 1907. He was 33 years of age. He was a member of the American Society of Mechanical Engineers and a member of the executive committee of the New York section. He leaves a widow and two children.

THOMAS HEPPLE NORTH, superintendent Crayford works, Vickers, Ltd., England, died recently from pneumonia, aged 42. The London *Times* mentions the respect shown at the funeral by his 15,000 employees. He had been honored by the Government for his services in making munitions, airplanes, etc. For three years prior to the outbreak of the war Mr. North was with the Colts Patent Fire Arms Mfg. Co., Hartford, Conn.

JOHN HEAPHY, for more than 22 years foundry superintendent of the Rhode Island Locomotive Works and the American Locomotive Co., Providence, R. I., died March 15 after a brief illness at Pittsburgh. He had been employed at the Montreal and Pittsburgh plants after the manufacture of locomotives was discontinued at Providence.

HERBERT L. BLANKENBURG, Milwaukee manager General Combustion Co., Chicago, died of pneumonia at his home in Milwaukee, March 18. Mr. Blankenburg was born at Milwaukee, Sept. 7, 1884. He was a graduate of the University of Wisconsin. He was connected with the General Electric Co. for several years prior to his association with the General Combustion Co.

SAMUEL GARRISON, president Expanded Metal & Fire Proofing Co., Pittsburgh, died at his home in that city, March 18. He was also vice-president and director of the Ben Franklin Coal Co. of West Virginia. He founded the Expanded Metal & Fire Proofing Co. in Pittsburgh about 19 years ago, and was widely known in the coal and pressed metal trades.

ALBERT W. MOYER, who was widely known as an expert in metallurgical and industrial furnaces and head of the A. W. Moyer Co., maker of fuel oil burners, died suddenly March 23 at his home at Belmar, N. J., aged 43 years.

Machinery Markets and News of the Works

RAILROAD LIST ISSUED

Burlington Road Inquires for 50 Tools

Question of Prices Is of Absorbing Interest to Both Buyers and Sellers

The Chicago, Burlington & Quincy Railroad has issued at Chicago the largest railroad list of machine tools that has appeared in some months. About 50 tools are required, representing the road's requirements for 1919. The tool trade is entertaining hopes that railroad financing plans may soon be completed so that a general buying program, which is known to be in contemplation, may begin.

An event which illustrates that there is a fairly good demand for machine tools was the sale of the equipment of the Stenotype Co., Indianapolis, valued at about \$1,000,000. Most of the tools were bid in by users, the prices they offered being higher than dealers were willing to pay. In many instances tools brought their original price. Milling machines induced lively bidding, there being an excellent demand for that type of tool.

Export business in machine tools is not making rapid headway, but foreign inquiries are multiplying and the trade has hopes of a gradual improvement. Some machine-tool builders in the Cincinnati district report that from 35 to 40 per cent of their present orders come from abroad. High ocean freight rates are undoubtedly a deterrent factor, and added to this is the scarcity of

bottoms, shipments sometimes being delayed for weeks because of inability of shippers to find cargo space.

Fortunately for American machine-tool builders the embargo put into effect by Great Britain on March 1 is not being strongly enforced. As a matter of fact, companies with established agencies in England are being permitted to ship into that country all that can be sold. The British Government has been granting licenses so freely, according to advices to THE IRON AGE from London, that British manufacturers are beginning to protest that the government is encouraging importation to the detriment of manufacture at home.

In all domestic machinery markets, the question of prices is of absorbing interest both to sellers and buyers. Those companies which have not reduced prices hear of cases in which their competitors have done so. Many in the trade feel that the reduction in steel and pig iron prices is likely to have an effect on tool prices. It is reported from Cleveland that dealers there look for a reduction on lathes, shapers and radial drills, but some machinery builders announce positively that they will not reduce prices before July 1. By some companies prices are being guaranteed against decline for 90 days from date of sale.

The New York market has been very quiet the past week, the only new inquiry of importance before the trade being that of the Dubied Machinery Co., 350 Broadway, New York, mentioned last week as having under consideration a plant in this country for making knitting machines. Its list includes lathes, milling machines, shapers and grinders.

New York

NEW YORK, March 25.

Buying of machine tools the past week has been in small volume. A few orders have been placed, but mostly for single tools or lots of two or three. There has been a moderate amount of new inquiry. The trade believes that the conference at Washington last week on prices of pig iron and steel has held back business which might otherwise have been placed.

A representative of the Dubied Machinery Co., 350 Broadway, is visiting machine-tool plants at Cincinnati and other manufacturing centers to select equipment for a plant to be built in this country for the manufacture of knitting machinery. About 100 or more tools will be required.

The Railway Power & Equipment Co., Woolworth Building, New York, has received an inquiry from Belgium for \$100,000 to \$200,000 worth of equipment for a plant to be built in that country. The list includes screw-cutting lathes, planers, shapers, turning and boring machines, slotters, radial drills, hammers, plate shears, equipment for manufacturing springs, and four 16-ton traveling cranes.

Crane builders are receiving a few inquiries, but very little business is being closed.

The Multiple Storage Battery Co., 427 West Fifth Street, New York, has arranged for the construction of a new plant, 60 x 120 ft., by the H. & B. Development Co., New York, at Jamaica, L. I. Contract for erection has been let to the Austin Co., 217 Broadway. The plant is estimated to cost close to \$20,000.

The Red Head Spark Plug Corporation, New York, has been incorporated with a capital of \$80,000 by M. Kaliski, H. L. Rashbaum and A. H. Hill, 4518 Richardson Avenue, to manufacture spark plugs and ignition equipment.

The Master Motor Truck Corporation, New York, has been

incorporated with a capital of \$50,000 by R. B. Hall, O. A. Schnell and C. J. Hughes, 1329 Madison Avenue, to manufacture motor trucks and parts.

The Lubric Art Mfg. Corporation, New York, has been incorporated with a capital of \$150,000 by F. T. Craven, H. Froeb and F. J. Knorr, 424 Gerard Avenue, to manufacture metal fabricating devices, cups, etc.

The Allied Machinery Co. of America, 120 Broadway, New York, has increased its capital from \$100,000 to \$5,000,000.

A new two-story ice and refrigerating works, to cost with machinery and equipment about \$75,000, will be constructed by the National Ice & Coal Co., 103 Park Avenue, New York, at 8-16 Tompkins Street. The structure will be about 120 x 120 ft. Sommerfeld & Steckler, 31 Union Square, are architects.

The Corona Typewriter Co., 129 West Forty-second Street, New York, with plant at Groton, N. Y., has increased its capital from \$1,500,000 to \$2,000,000.

The Manufacturers' Equipment Exchange, New York, has been incorporated with a capital of \$50,000 by R. Grant, H. E. and A. C. Ackerly, 914 Ditmas Avenue, Brooklyn, to manufacture motors, electrical equipment, boilers, etc.

The Perfect Refillable Fuse Co., Inc., New York, has been incorporated with a capital of \$50,000 by W. F. Muller, H. Vantwistern and A. H. Sarafan, 140 Nassau Street, to manufacture fuses.

The Chevrolet Motor Co., Broadway and Fifty-seventh Street, New York, has leased a group of factory buildings on Eleventh Avenue, from Fifty-sixth to Fifty-seventh streets, formerly used by the Linen Thread Co. The structures total about 200 x 200 ft., providing about 100,000 sq. ft. of manufacturing area, and will be used for a new motor manufacturing plant. The works will be operated in conjunction with the company's plant at Kingsland Point, Tarrytown, N. Y. The lease covers a period of years and aggregates \$400,000. The company has had plans prepared for the rebuilding of

the portion of its Tarrytown plant recently destroyed by fire.

Old Metals, Inc., New York, has recently been incorporated with a capital of \$203,000 by S. Ecker, T. W. and A. A. Moers, 120 West Seventieth Street, to manufacture metals.

The Skywing Aircraft Corporation, New York, has been incorporated with a capital of \$60,000 by N. G. Higam, H. S. Stoneham and W. Harper, Jr., 5 East Forty-fifth Street, to manufacture aircraft parts.

The International Cork Co., 99 Sutton Street, Brooklyn, is considering the rebuilding of its two-story and basement works at 53-59 Congress Street, partially destroyed by fire, March 8, with a loss of about \$50,000.

The Marble Toy Game Co., New York, has been incorporated with a capital of \$100,000 by C. J. and H. D. Cray and J. W. Lyons, 108 West Forty-third Street, to manufacture toys, etc.

The Arhos Steel Products Co., New York, has been incorporated with a capital of \$100,000 by W. F. Ashley, Jr., A. Foulds, Jr., and J. S. Galland, 15 John Street, to manufacture iron and steel specialties.

The Master Motor Truck Corporation, New York, has been incorporated with a capital of \$50,000 by C. J. Hughes, New York; Rae B. Hall, Philadelphia, and Oscar A. Schnell, Scranton, Pa., to manufacture motor trucks.

The Wireless Specialty Apparatus Co., Albany, N. Y., manufacturer of wireless equipment, has increased its capital to \$700,000.

Lesser & MacGruer, Inc., Albany, has been incorporated with a capital of \$40,000 by J. G. and J. A. MacGruer and R. W. Lesser, to manufacture factory equipment, mill specialties, etc.

The Atlantic Metal Novelty Works, Newark, N. J., has been incorporated with a capital of \$25,000 by Davis Joseph, Newark, and Harry Joseph, Passaic, to manufacture metal products.

The International Specialty Mfg. Co., Inc., Newark, has been incorporated with a capital of \$100,000 by S. M. Hollander, Milton L. Ott and I. A. Stern to manufacture mechanical toys, metal specialties, etc.

A new machine shop and automobile repair works will be constructed by Gustav Kufferman, Newark, at 225-57 Milford Avenue, to cost about \$15,000. The structure will be one story, 50 x 132 ft. M. B. Silberstein, 122 Springfield Avenue, Newark, is architect.

The Precision Tool Co., 207 Market Street, Newark, has filed notice of organization to manufacture tools, etc. Leland W. VanDenburgh, 20 Gladstone Avenue, and George Steinbach, 119 Middleton Avenue, head the company.

The Federal Adding Machine Corporation, 50 East Forty-second Street, New York, manufacturer of calculating machines, with works at New Haven, Conn., is reported to be planning for the construction of a new plant at Newark, at an estimated cost of about \$150,000.

The Auto Equipment Corporation, Newark, has been incorporated with a capital of \$100,000 by Henry Orkin and Edmund A. Rosevay, to manufacture automobile equipment, parts, etc.

The Metal & Thermit Corporation, Cornelson Avenue, Jersey City, N. J., has completed plans for the construction of a one-story addition to its welding works on Johnston Avenue, 50 x 100 ft., to cost about \$17,000.

Buffalo

BUFFALO, March 24.

Plans are being prepared for a new foundry to be erected by the Century Iron Co., 1453 Niagara Street, Buffalo.

The Gleason Works, 1000 University Avenue, Rochester, manufacturer of gears, has awarded contract for the erection of a machine shop, 160 x 335 ft., from plans of the Ferguson Steel & Iron Co., Buffalo, to cost \$70,000.

The Clyde Engineering Corporation, Buffalo, is fitting up a plant at West and Forest avenues for the manufacture of hydraulic suspension shock absorbers.

The Watertown Bay Machine Co., Watertown, N. Y., has purchased a site on which it will build a plant to cost \$10,000.

The Fancher Flexible Shaft Co., Baldwinsville, N. Y., W. G. Miller president, has plans in preparation for a factory building to be erected this summer.

The Oswego Brass & Iron Co., Oswego, N. Y., will build an addition, 65 x 165 ft., to cost \$70,000.

The Wizard Products Co., Buffalo, has been incorporated with a capital of \$50,000 by H. J. Frank, N. T. Weser and C. Forest, to manufacture automobile specialties.

The Niagara Falls Metal Stamping Works, 237 Tenth

Street, Niagara Falls, N. Y., is considering the rebuilding of its works, destroyed by fire, March 7, with loss of about \$75,000. The plant has been given over to the manufacture of chain specialties, sheet metal stampings, etc. R. C. Eldridge is president.

The Prospect Tire & Rubber Co., Buffalo, has been incorporated with a capital of \$500,000 by Julius L. Rosenblatt and Alexander Jamison, to manufacture tires and rubber goods.

The increase in capital of the Weekes-Hoffman Co., Dickerson Street, Syracuse, N. Y., previously announced from \$200,000 to \$500,000, will be to the extent of \$750,000. The company specializes in the manufacture of tools, chucks, etc., and plans for general expansion.

The Power Specialty Co., Dansville, N. Y., manufacturer of Foster superheaters, is arranging for the manufacture of a new fuel-saving device, now being developed. The company has reduced its working force by about 35 men; a total of over 300 employees is used at the plant under normal operations. A strike at the plant was declared on March 12, making reduced operations necessary.

The Rochester Railway & Light Co., Rochester, N. Y., has made application for permission to issue securities for \$500,000, the proceeds to be used for extensions and betterments in plant and electric system. The electric department extensions and improvements are estimated to cost about \$335,000, with underground conduit system to cost \$10,000.

Philadelphia

PHILADELPHIA, March 24.

The General Equipment Co., Philadelphia, has been incorporated with a nominal capital of \$6,000 by C. N. Shaffner and associates to manufacture industrial and factory equipment.

Max M. Sladkin, 503 Market Street, Philadelphia, manufacturer of bicycles, has purchased property at Tenth and Buttonwood streets, 80 x 160 ft., for the establishment of a factory for the manufacture of bicycles and bicycle parts.

The Bureau of Yards and Docks, Washington, has awarded a contract to M. H. McCloskey, Jr., 1620 Thompson Street, Philadelphia, for the construction of shipbuilding berth extensions, to be known as slips Nos. 2 and 3, at the League Island Navy Yard, at a cost of \$292,400. The structures will be reinforced concrete and steel, 122 x 169 ft., and 128 x 148 ft.; the work will include extension in crane runway and an increase in operating facilities.

The Water Department, Philadelphia, is planning for an appropriation of about \$300,000 for the installation of new pumping machinery at the Queen Lane water station. It is planned to increase the capacity from 70,000,000 to about 150,000,000 gal.

The Peters Engineering Co., 3202 Chestnut Street, Philadelphia, has commenced the erection of a new one-story shop, 54 x 105 ft., on Woodland Avenue, near Chestnut Street.

The Hutchinson Storage Battery Co., 230 South Warren Street, Trenton, N. J., has had plans prepared for a one-story addition to its plant, to cost about \$15,000. The company was recently incorporated with a capital of \$50,000. Charles A. Hutchinson is president, and John Hutchinson, secretary and treasurer.

The Titan Battery Service Co., Trenton, N. J., has been incorporated with a capital of \$25,000 by Norman T. Rogers, Marcus B. Robinson and Thomas E. Lunger, to manufacture storage batteries.

The Lansdale Motor Co., Lansdale, Pa., has been incorporated with a capital of \$10,000 by Joseph A. Willis and associates to manufacture motor parts, etc.

The Camden Motor Corporation, Camden, N. J., is having plans prepared for the construction of a new two-story plant on the White Horse Pike, Collingswood, N. J.

In connection with the proposed expansion at its plant, the Bethlehem Fabricators, Inc., Bethlehem, Pa., manufacturer of structural steel shapes and other iron and steel products, has arranged an appropriation of \$150,000 to be used for additions to different departments, with new equipment as required.

The National Supply & Machine Co., Harrisburg, Pa., has been incorporated with a capital of \$50,000 by F. H. Alleman, Summit, N. J., and associates, to manufacture machinery, etc.

The Altoona & Northern Railroad Co., Juniata, Pa., is considering plans for the rebuilding of its local car repair shops, including engine house, destroyed by fire March 5 with loss of about \$75,000.

Bids are being taken by the Boyertown Burial Casket Co., Boyertown, Pa., for a one-story brick addition to its plant, 100 x 200 ft.

The Vulcan Iron Works, Wilkes-Barre, Pa., has voted to increase its capital stock from \$1,500,000 to \$3,000,000.

The Reading Valve & Forgings Co., Reading, Pa., has been incorporated to manufacture castings and forgings, and will start soon on the erection of its plant. The capital stock is \$100,000. The incorporators are J. Turner Moore, Wyoming, Pa.; M. G. Moore, Reading, Pa., and W. S. Dietrich, Kutztown, Pa.

The Philadelphia Trailmobile Co., Philadelphia, Pa., has been incorporated with a capital stock of \$25,000 to manufacture motor vehicles, trail tractors, machinery, etc. William E. Shipley, 506 Locust Avenue, Germantown, Philadelphia, is the principal incorporator.

The East Penn Foundry Co., Macungie, Pa., has been organized to manufacture iron, brass and metal castings and has been incorporated with a capital stock of \$75,000. It is understood that building operations will be started within a short time. John G. Fleck, 50 North Fifth Street, Philadelphia; Edwin E. Pryor, 342 South Fifth Street, Reading, Pa., and J. Walter Singmaster and H. M. Singmaster, Macungie, Pa., are the incorporators.

The Pennsylvania Welding Co., Philadelphia, Pa., has been incorporated at Harrisburg, Pa., with a capital stock of \$10,000. Clayton R. Rhinkett, Forty-sixth and Walnut streets, and John S. Thompson, 6146 Torresdale Avenue, Philadelphia, are the incorporators.

New England

BOSTON, March 24.

The New England Steel Forge Co., Inc., Hartford, Conn., has been incorporated with a capital of \$20,000 to manufacture forgings, tools, etc. H. T. Calkins is president and treasurer; M. H. Weber, secretary, and D. J. Griffin, assistant treasurer.

The Caldwell Tool Co., Springfield, Mass., has been incorporated with a capital of \$25,000 by Edward C. Taylor, Harlan P. Small, and M. O. Munson, to manufacture tools and machinery.

The Pratt & Cady Co., Hartford, Conn., manufacturer of valves, etc., will build a one-story extension to cost about \$7,500.

The Worcester Steel Products Co., Worcester, Mass., recently incorporated with a capital of \$75,000, will take over the factory of Henry L. Hanson, 25 Union Street, heretofore used for the manufacture of carpenters' tools. The new organization will specialize in the manufacture of reamers, taps, dies and other cutting tools. The capacity of the existing works will be increased. Arthur L. Lewis is president and general manager.

The New Britain Tool & Mfg. Co., 5 Harvard Street, New Britain, Conn., has filed notice of organization with capital of \$50,000 to manufacture tools and machinery. C. Adrian Carlson is president; Rudolph Sandberg, vice-president; Carl W. Hammar, treasurer; and Harold Johnson, secretary.

The Bridgeport Hardware Mfg. Corporation, Bridgeport, Conn., has increased its capital by \$175,000, or to a total of \$475,000.

The property of William M. Whitney, Winchendon, Mass., manufacturer of metal products, will be taken over by Baxter D. Whitney & Son, Inc., recently incorporated with a capital of \$1,250,000 to manufacture machine tools. The incorporators are William M. Whitney, Winchendon; Marcus L. Foster and Frank C. Smith, Jr., Worcester.

The Liberty Engine Co., Main Street, Seymour, Conn., has been organized with a capital of \$100,000 to manufacture engines, etc. John Swan is president; E. H. Robston, treasurer, and W. B. Jolley, secretary.

The Fellows Gear Shaper Co., Springfield, Vt., manufacturer of gear cutting machinery, is now operating its plant on an 8-hr. day, with full quota of employees. This schedule will be maintained indefinitely; the company is said to have orders on hand for more than 12 months.

The New York, New Haven & Hartford Railroad Co., New Haven, Conn., has filed plans for the construction of a new boiler plant at its yards at Springfield, Mass.

The Hartford Battery Mfg. Co., Hartford, Conn., has been incorporated with a capital of \$200,000 by Frank H. Wilmot, Fred W. Barhoff, Hartford, and S. P. Griswold, West Hartford, to manufacture electric batteries.

Marcus Mason & Co., Inc., Boston, manufacturer of rice and sugar plantation machinery, with works at Framingham, has taken over the business of the William L. Dines, Jr., Co., 172 Union Street, Boston, manufacturer of similar equip-

ment. The business of the two organizations will be merged and William L. Dines, Jr., president of the last-named company, will become associated with the new affiliation.

The Hergi Mfg. Co., Bridgeport, Conn., has been incorporated with a capital of \$50,000 by John S. Pullman, Claude A. Herman, and H. E. Gill, to manufacture tools and machinery.

Pittsburgh

PITTSBURGH, March 24.

The DeLong Motor & Truck Co., Pittsburgh, has filed plans for the construction of a new two-story brick and concrete machine works and repair shop on South Highland Avenue, to cost about \$35,000.

The Automobile Corporation, Pittsburgh, has been incorporated with a capital of \$60,000 to manufacture automobiles, parts, etc. Monte I. Davis is the principal incorporator.

The George W. Ziegler Machinery Co., 515 First Avenue, Pittsburgh, is taking bids for the construction of a one-story top addition, about 40 x 80 ft.

The Carnegie Steel Co., Pittsburgh, is planning for the rebuilding of its pattern works at its shops at Farrell, Pa., destroyed by fire recently, with loss of about \$50,000.

In connection with the new five-story automobile building to be constructed by the Oakland-Pittsburgh Co., Pittsburgh, on Amber Street, near the Baum Boulevard, at a cost of about \$60,000, a complete machine shop will be installed with facilities for the manufacture of parts as well as for repair work.

The City Council, Oil City, Pa., is planning for the construction of a new one-story boiler plant to cost about \$45,000.

The J. C. McKinley Co., First Street, Moundsville, W. Va., is planning for the installation of electrically-operated equipment to replace the former steam-driven apparatus in connection with rebuilding its coal tippie recently destroyed by fire.

The Garrett Automobile Co., Clarksburg, W. Va., has been incorporated with a capital of \$50,000 by John H. Newlon, David F. Wilson and Michael Huber, to manufacture automobiles and parts.

The St. Albans Light, Water & Ice Co., St. Albans, W. Va., recently incorporated with a capital of \$100,000, to consolidate the St. Albans Water & Electric Co. and other local interests, is planning for extensions in its electric plant.

The Conshohocken Burial Casket Co., Conshohocken, Pa., has been incorporated with a capital of \$25,000 by J. T. Carroll and associates to manufacture caskets.

Plans are being prepared by the Board of Trustees, St. Vincent's College, Beatty, Pa., for the construction of a new power plant to cost about \$100,000. Joseph A. Langdon & Sons Co., 608 Grant Street, Pittsburgh, is consulting engineer.

The Erie Forge & Steel Co., Erie, Pa., is reported to have taken a large order for forgings for the Navy Department which will keep its plant busy for fully a year.

The Guyan Machine Works, Logan, W. Va., wants prices on single-head bolt cutters, 1½ or 2 in.; gear cutters, 15-hp. natural gas engines, I-beams, 7½-hp. motors, motor-driven gasoline pumps, and boiler tubes.

The E. E. White Coal Co., Glen White, W. Va., plans to install a steel tippie and additional machinery.

Chicago

CHICAGO, March 24.

The business of the week has been fairly satisfactory in aggregate volume though there have been few large individual sales. Here and there a few fair-sized groups of tools have been taken, as in the case of a Chicago manufacturer of automobile accessories which purchased eight small drill presses for immediate delivery, and a locomotive appliance company which bought several large turret lathes. The trade, while admittedly doing fairly well, is not satisfied with the situation because of the outlook as to the future. It is not able to see very far ahead with any great degree of certainty.

The Chicago, Burlington & Quincy list, which was referred to some weeks ago as in course of preparation, has been issued, and constitutes the best railroad list which has appeared in many months. It is stated to represent

the road's requirements for 1919, and calls for delivery at many points along the line. The list follows:

One 36 x 36-in. x 10-ft. planer.
 One 26 x 26-in. x 10-ft. planer.
 One 18-in. x 5-ft. engine lathe.
 One 16-in. x 3-ft. brass turning lathe.
 One 21-in. hollow hexagon turret lathe.
 Two vertical turret lathes with 36-in. swing.
 One vertical turret lathe, 42-in. swing.
 One 36-in. vertical boring mill.
 One 36-in. vertical turret lathe.
 One car wheel boring mill.
 One 24 x 96-in. engine lathe.
 One 22 x 72-in. engine lathe.
 One 20 x 60-in. engine lathe.
 One 20 x 72-in. engine lathe.
 One 36 x 96-in. engine lathe.
 One 24 x 72-in. engine lathe.
 One 42 x 72-in. heavy duty engine lathe.
 One 24 x 96-in. engine lathe.
 One 28 x 72-in. engine lathe.
 One 52-in. tire turning lathe.
 Two 18 x 60-in. engine lathes.
 One 36-in. radial drill.
 One 72-in. radial drill.
 One 20-in. upright high speed drill.
 One 24-in. upright drill.
 One 32-in. upright drill.
 One upright high speed drill, 30-in. circular table.
 Two upright heavy duty high speed drills.
 One 32-in. draw-cut shaper.
 One 28-in. back-gear shaper.
 One automatic gear shaper.
 One double-acting power press.
 One twist drill grinder.
 One universal grinding machine, 12-in. swing.
 Four double-end pedestal dry grinders.
 One double-end disk grinder.
 One locomotive link radius grinder.
 One oscillating surface grinder, 42-in. between housings with 14-ft. bed.
 One rotary flue welder.
 One double-end punch and shear with 48-in. throat with capacity to punch 1-in. hole in $\frac{3}{4}$ -in. plate.
 Two double-end punch and shears, 36-in. throat, with capacity to punch 1-in. hole in 1-in. plate.

The Bucyrus Co., South Milwaukee, Wis., is proceeding with great deliberation in regard to the tools for which it inquired recently. No orders have been placed.

A number of Chicago dealers were present at the sale of nearly \$1,000,000 worth of machine tools which began March 18, at the plant of the Stenotype Co., Indianapolis. It is reported that the sale was largely attended and that users purchased perhaps 90 per cent of the tools offered. They paid prices which were far too high to interest the dealers. In many instances machines brought their original price. Milling machines induced lively bidding, confirming the general demand that exists for that type of tool. Some of the tools were sold subject to lien inasmuch as they had not been fully paid for. The bulk of those offered were small machines.

Settlement of claims originating from war contracts is proceeding very slowly, and the trade believes that still slower progress will be made if the local adjustment board's office is closed, as has been suggested, and the work transferred to Washington. Government inspectors continue to pursue their work at various plants, including the Symington-Chicago Corporation, Cribben & Sexton, and International Harvester Co.

Following the action of a prominent manufacturer of planers in reducing his price about 17 per cent, other builders have made reductions to meet the lower price. The principal makers of large turret lathes are holding firmly to their quotations, although some makers are quoting lower figures.

Bids have been taken on a two-story factory, 125 x 200 ft., in Cortland Street, near North Forty-fifth Avenue, Chicago, for the National Enameling & Stamping Co., 346 West Kinzie Street. It will be of mill construction and cost about \$75,000.

Contracts have been awarded for a one-story factory, 189 x 462 ft. and 25 x 198 ft.; a two-story annex, 48 x 125 ft., and a tower, 26 x 26 ft., 60 ft. high, at 5740 West Twelfth Street, Chicago, for the Victor Mfg. & Gasket Co., maker of gaskets for gas engines. The cost will be \$250,000.

The Federal Refrigerating Co., Chicago, a new company affiliated with the Hygienic Ice Co., has purchased $24\frac{1}{2}$ acres between Halstead Street and Racine Avenue, and 140th Street and 142nd Street, Riverdale, Chicago, on which will

be erected an ice-manufacturing plant to cost \$1,000,000. Work on the first unit, which will be 200 x 500 ft., has been started.

The Decatur Malleable Iron Co., Decatur, Ill., has increased its capital stock from \$100,000 to \$200,000.

The Chicago Gear Mfg. Co., West Jackson Boulevard, Chicago, will soon commence the construction of its proposed new one-story addition, 150 x 175 ft., to cost about \$30,000. Bids have been asked.

The Scully Steel & Iron Co., Chicago, has taken title, through its president, Charles Heggre, to property on Thirty-eighth Street, 100 x 125 ft., and on Thirty-fifth Street, 100 x 125 ft., for a total consideration of about \$15,000.

R. J. Johnson & Son, 517-37 Noble Street, Chicago, are planning for the rebuilding of their furniture manufacturing plant, partially destroyed by fire. The structure is four-stories, 30 x 150 ft. The work is estimated to cost \$40,000.

The Illinois Central Railroad Co., Chicago, is planning for the construction of a new boiler plant at Centralia, Ill.

The Auto Spring Mfg. Co., Kansas City, Mo., will build a new two-story plant, 25 x 130 ft., for the manufacture of automobile springs. It is estimated to cost about \$10,000, exclusive of machinery.

The John Deere Plow Co., Moline, Ill., is taking bids for the erection of a one-story addition to its plant at Kansas City, Mo., 90 x 125 ft.

A new power plant will be erected by Wilson & Co., Chicago, in connection with their canning works to be located at Forty-fourth Street and Western Avenue.

The Allan Stoker Furnace Co., Minneapolis, Minn., will build a new one-story machine shop, 42 x 120 ft.

The Hub City Iron Works, Aberdeen, S. Dak., is planning for the construction of a one-story, brick addition to its foundry, 30 x 65 ft.

Baltimore

BALTIMORE, March 24.

The Electric Hose & Rubber Co., Wilmington, Del., manufacturer of rubber air brake hose and other hose, has taken bids for the construction of a two-story brick addition to its plant, 65 x 205 ft. C. D. Garretson is treasurer and general manager.

The Maryland Smelting & Refining Co., West Church Street, Hagerstown, Md., has arranged for the construction of a new metal concentrating plant, with electrical and other equipment; a one-ton brass melting furnace will be installed. It is proposed to establish a capacity of about 20 tons a day of brass and aluminum ingots. Joseph Brenner is president.

The Liberty Storage Battery Co., Wilmington, Del., has been incorporated with a capital of \$502,000 by C. Hellig and E. V. Fulton, Wilmington, to manufacture electric storage batteries.

The Georgia-Alabama Power Co., Albany, Ga., is considering plans for the construction of a new hydroelectric power plant on the Flint River, with initial capacity of about 10,000 hp.

The Killtoil Farm Tractor Co., Richmond, Va., has been incorporated with a capital of \$2,000,000 by J. C. Taylor, John Howard and J. McD. Wellford, to manufacture tractors.

The Albany Handle Co., Albany, Ga., is considering plans for rebuilding its plant recently destroyed by fire with loss of about \$25,000. It is operated by the Standard Handle Co., Macon, Ga.

Boiler equipment, pumping machinery, power transmission apparatus and other equipment will be installed in the one-story addition, 32 x 200 ft., to be constructed by the Middletown Packing Co., Middletown, Md.

The Eureka Iron Works, Lincoln, N. C., has been incorporated with a capital of \$25,000 by Henry Page and associates to manufacture iron and steel products.

The J. & D. Tire Co., Charlotte, N. C., manufacturer of automobile tires, has increased its capital from \$1,000,000 to \$1,100,000.

The Carolina Tire & Accessory Co., Columbia, S. C., manufacturer of automobile tires, has increased its capital from \$15,000 to \$50,000.

The American Truck Body Co., Martinsville, Va., has been organized to manufacture automobile truck bodies. H. S. Winn is president and R. A. Fontaine, secretary and treasurer.

The Lenoir Chair Mfg. Co., Lenoir, N. C., will build a one-story addition to its plant, 80 x 145 ft.; new boiler

equipment will also be installed. The extension is estimated to cost about \$10,000.

The Queen City Storage Battery Co., Raleigh, N. C., has been incorporated with a capital of \$25,000 by F. M. Laxton and associates.

The Virginia Motor Car Co., Roanoke, Va., manufacturer of parts, etc., has increased its capital from \$25,000 to \$50,000. Frank S. Cooper is manager.

The Carolina Electric & Machinery Co., Greenwood, S. C., has been incorporated with a capital of \$25,000 by G. W. Gardner, Kenneth Baker and G. L. Sloan, to manufacture electric equipment, machinery, etc.

The Harvey Co., 113 South Street, Baltimore, wants prices on 20-hp. portable boilers.

The following in Baltimore will install motors: S. Harris, 2119 East Monument Street; Joseph Mazucki, 1906 Poplar Grover Street; Jangstoh & Co., 237 West Biddle Street; E. T. Brook, 423 West Henrietta Street; D. Amorosa, 1203 Edmondson Avenue; Simon Jacobson, 1204 Aisquith Street; I. Leverington, 709 South Fremont Avenue; John Faraino, 3605 Eastern Avenue; M. Heath, 520 West Cross Street; C. R. Klosterman, Park Heights Avenue and Taney Road; Waldhauser Brothers, 1036 Rutland Avenue.

J. W. Miner, Ronda, N. C., wants prices on second-hand 20 to 25-hp. oil engines.

Prices on second-hand 125-hp. boilers are wanted by the Lenoir Chair Mfg. Co., Lenoir, N. C.

The Southern Shipyard Corporation, Newport News, Va., has increased its capital stock from \$100,000 to \$200,000.

Porter & Moore, Norfolk, Va., want prices on upright drills.

Dealers' prices, date of shipment, etc., are wanted by J. W. Hoopes, Denbigh, Va., on medium-sized milling machines and grinders, tool room lathes and attachments, wet-tool grinders, radial drills, sliding head drills, speed drills, shapers, boring and turning mills, planers, engine lathes, slotters, punches, shears, 15-ton electric cranes, small steam hammers and other machines.

The Carolina Electric & Machinery Co., Greenwood, S. C., has been incorporated with \$25,000 capital stock by Kenneth Baker, G. W. Gardner and G. L. Sloan.

The Terry Shipbuilding Corporation, Fort Wentworth, Savannah, Ga., wants bids on steel castings, grey-iron casting and forgings.

The Brigman Motor Co., Atlanta, Ga., plans to establish a wood-working shop and other departments.

The Dothan Milling & Mfg. Co., Dothan, Ala., plans to install planing mill and box-making machinery.

Detroit

DETROIT, March 24.

The Olympian Motors Co., Pontiac, Mich., has increased its capital stock to provide for expansions and has elected Fred K. Parke, president; St. Clair Couzens, vice-president and director of sales; William Poassmore, vice-president and treasurer; C. E. Callender, secretary.

The American Blower Co., Detroit, is having plans prepared for the erection of a four-story brick and steel foundry near Gratiot Avenue.

The Detroit Heat Treating Co., Detroit, has let contracts for a one story and basement factory on Bellevue and St. Paul avenues.

The Detroit Edison Co., Detroit, has let a general contract for the erection of a power house at the corner of Congress Street and Cass Avenue.

The Bollstrom Motors Co., Detroit, contemplates the erection of a plant at St. Louis, Mich.

The Detroit Wire Fabric Mfg. Co. is moving its plant from Detroit to Ann Arbor, Mich. Dr. Fred Arner is president.

The Mansfield Steel Corporation, which recently took over the business of the J. E. Boller Iron & Wire Works, Detroit, has begun the manufacture of steel truck bodies, truck and tractor frames, radiator guards, and pressed steel parts for motor cars in addition to its former business of ornamental iron and bronze work. J. B. Marsh is president and general manager. The company recently placed a contract for pressed steel tractor wheels with Wickes Brothers, Saginaw, Mich.

Fire caused \$200,000 damages in the plant of the B. & H. Machine Product Co. and the Account Register Co., Detroit, last week.

The Hayes Wheel Co., Jackson, Mich., manufacturer of automobile wheels, has issued \$1,000,000 of first mortgage bonds to provide for expansion of its business.

The Michigan Screw Co., Lansing, Mich., is purchasing 15 to 20 tons of automobile parts daily for 15 different concerns and has almost completely readjusted from Government work. It has retained the special machinery installed for war work to be used in turning out new products.

The Jackson Screw Products Co., Jackson, Mich., has been incorporated to manufacture screws, spark plugs and small automobile parts. Camiel Thorez is president; Elmer Thayer, vice-president, and J. J. Best, secretary-treasurer.

The Frost Gear & Forge Co., Jackson, Mich., has had plans prepared for an addition, work on which will start within a few weeks.

The Kalamazoo Motors Corporation, Kalamazoo, Mich., is being organized with a capital of \$250,000 to take over the business and assets of the Lane Motor Truck Co., Kalamazoo, Mich. The company holds patent rights on an axle which it will manufacture. An option has been taken on a 10 acre site on which it is proposed to build a factory for the manufacture of trucks. Among the stockholders are A. L. Pratt, president King Paper Co.; Frank H. Milham, W. B. Milham, Noah Bryant, Joseph E. Brown and H. P. Kauffer, of the Bryant Paper Co.

The Lockwood-Ash Motor Co., Jackson, Mich., manufacturer of marine engines, is erecting an addition to double its production.

The Bates Tractor Co., Lansing, Mich., is preparing to resume volume production of its new farm tractor which will be of a smaller type than its original machine.

The Holley Kerosene Carburetor Co., 145 East Willis Avenue, Detroit, has completed plans for the erection of a new plant on Vancouver Avenue, estimated to cost about \$50,000.

A new one-story power plant, 50 x 100 ft., will be erected by the Banner Salt Co., Marine City, Mich.

A new boiler plant to cost about \$30,000 will be erected by the Mullen Brothers Paper Co., St. Joseph, Mich. Preliminary plans are being prepared.

The Liberty Starter Co., 205 East Jefferson Avenue, Detroit, Mich., manufacturer of auto starting equipment, is having plans prepared for the erection of an addition.

Bids have been taken for a four-story factory, 100 x 150 ft., in Grand Rapids, Mich., for the Grand Rapids Brass Co. The work was postponed last fall.

Cincinnati

CINCINNATI, March 24.

Foreign inquiry for machine tools is keeping up very well, but high ocean freight rates undoubtedly is holding up considerable business. Even when the foreign customer is willing to pay these rates he is inconvenienced by the scarcity of bottoms. It is not an infrequent occurrence for a shipment to lie in New York six weeks or more before it can be loaded on board ship. At present the average percentage of foreign business reported by firms with European connections is around 35 to 40 per cent.

Recently makers of cotton oil mill machinery have purchased some machine tools, mostly boring mills. There is also a very fair demand from automobile manufacturers. Repair shops in the oil well districts are also buying single tools, most orders from this source being for medium sized lathes. Orders from the railroads are conspicuous for their absence. There is considerable complaint made as to slow payment on the part of the railroads and some supply firms are beginning to sidestep business from this source.

An unconfirmed report is that a local firm recently booked an order for a lot of lathes for trade schools, which, if correct, indicates that the Government is not following out its rumored policy to distribute second-hand machines in its possession to technical schools.

Portable electric drilling and grinding machine makers are all busy with about 30 per cent of their output absorbed by the export trade.

The Standard Carbonic Co., Cincinnati, will make an addition to its plant at Sixth and Burns streets.

The Cincinnati Auto Specialty Co., 312 Main Street, Cincinnati, has increased its capital stock from \$10,000 to \$40,000.

The Hamilton Thermometer Co., Hamilton, Ohio, recently incorporated with \$50,000 capital stock, has commenced work on a plant that will be used for making commercial and industrial thermometers. D. H. DeArmond is president.

The Peters & Herron Co., Columbus, Ohio, recently incorporated with \$400,000 capital stock, has taken over the business of the Peters & Herron Dash Co., the Nu-Back Fur Co. and the Ohio Co. The machinery of the first two plants will be removed to a manufacturing building on South High

Street. The new company expects to add to its line of automobile accessories.

The Dayton Fan & Motor Co., Dayton, Ohio, contemplates increasing the capacity of its plant at an early date.

Lucein Custer, Dayton, intends to erect a plant at 119-121 Franklin Street to manufacture juvenile automobiles. The present plant is at 26-28 Ludlow Street.

The Kingsport Hardware Co., Nashville, Tenn., has been incorporated with a capital of \$30,000 by R. H. and P. E. Fuller and C. B. Hancock, to manufacture hardware specialties.

The United Motors Co., Third Street, Louisville, Ky., has been incorporated with a capital of \$10,500 by L. L. Boyd, B. E. Bryan and Moody Boyd, to manufacture motor specialties, parts, etc.

The Louisville Pattern Works, Louisville, has been incorporated with a capital of \$15,000 by John F. Reeder, A. J. Roth, and P. W. Roth, Muncie, Ind., where they operated a foundry and pattern shop. A local plant will be established and patterns will be made for engines, cylinders, crank and transmission cases, and other parts.

The Wizard Spark Plug Co., Dayton, has been incorporated with \$15,000 capital stock by Arthur McDonald and others. Nothing is known as to manufacturing plans.

The Superior Brass Mfg. Co., Mansfield, Ohio, has increased its capital stock from \$35,000 to \$60,000. It will enlarge its plant at an early date and install a few new special machines.

The Columbus Wood Turning Co., Columbus, Ind., recently organized, is equipping a plant for the manufacture of tool handles. David C. Behrman is one of the officials of the company.

Cleveland

CLEVELAND, March 24.

Machinery houses did a fair volume of business the past week. Orders, however, were confined almost wholly to single machines and to lots of not over three or four tools. Orders directly from automobile companies are not as numerous as they have been, the demand now being largely from sub-contractors making automobile parts. The Dort Motor Car Co., Flint, Mich., has placed orders for a number of turret lathes, and there are two inquiries from Western tractor companies for fair-sized lots of turret lathes. During the week a market was found in this section for quite a few used turret lathes from Canadian plants. The Hercules Motor Mfg. Co., Canton, Ohio, has purchased about a dozen lathes for crank shaft work for the Ford tractor, and other crank shaft equipment is being placed by sub-contractors.

The question of a price reduction on machine tools is still absorbing considerable interest. The reduction on planers, amounting to as high as 25 per cent on some makes, has stimulated the demand for these tools by bringing out orders held for lower prices. Many of the trade feel that the reduction in steel prices is bound to have an effect on machine tools. While dealers look for a reduction shortly on lathes, shapers and radial drills, some machinery builders announce positively that they will not reduce prices before July.

The McKinney Steel Co., Cleveland, is inquiring for a double end punch and shear with a 25 in. throat; the Arco Co., Cleveland, for a 24 x 24 in. x 8 ft. planer and a 22 x 12 in. lathe, and the Craig Tractor Co. a 14 x 6 in. lathe.

The M. & S. Gear Corporation will move from Detroit to Cleveland, and is building a new plant on East 152nd Street, adjoining that of the Torbensen Axle Co. W. T. Walker is president and general manager.

The Reflex Ignition Co., 1708 Payne Avenue, Cleveland, has placed contracts for the erection of a new plant to replace the one that was recently damaged by fire. The building will be two-stories of reinforced concrete, 60 x 160 ft.

The Holan Metal Products Co., Cleveland, has been incorporated with a capital stock of \$50,000 by James Holan, 3115 West Forty-first Street, H. D. Brainerd and others.

The Deitz Electric Co., 1243 Oregon Avenue, Cleveland, will build a two-story plant 38 x 85 ft.

The Accurate Machine Co., Whitney Power Block, Cleveland, has placed contract for the construction of a machine shop 160 x 180 ft.

The Jordan Motor Co., East 152nd Street, Cleveland, plans the construction of a japanning plant which will be equipped with several ovens.

The Schwarz & Schwarz Co., Cleveland, has been incorporated with a capital stock of \$20,000 to operate a foundry.

Benjamin Schwarz, 114 Engineers Building, is interested.

The Northern Ohio Hydroelectric Co. has been incorporated with a capital stock of \$300,000 by George R. McKay, Raymond R. Oliver and others. It plans to build three large dams and a hydroelectric plant in Ashtabula county, Ohio, to supply Ashtabula with electricity.

The Toledo Screw Products Co., Toledo, has placed on the market its screw machine plant which has been doing shell work. The equipment includes six 4-spindle automatics, 59 single spindle automatics, 12 hand screw machines, milling machines and various small tools. This company is planning to engage in the manufacture of suction sweepers.

The Akron Equipment Co., Akron, Ohio, has placed a contract for the construction of a machine shop to cost about \$15,000.

The Bonnot Co., Canton, Ohio, has increased its capital stock from \$500,000 to \$1,000,000.

Schlemmer & Graber, Canton, Ohio, plan to erect a factory, 50 x 130 ft. At present a machine shop is being equipped.

The Reliance Mfg. Co., Massillon, Ohio, has placed a contract for a one-story addition, 60 x 100 ft.

The Rowland & Price Steel & Iron Co., Cambridge, Ohio, has equipped a plant which is now being placed in operation for the manufacture of wheels for mine cars and repairing steam shovels, and will shortly begin the erection of a new factory. The offices are in Cleveland. George D. Rowland is president and general manager; J. M. Ickes vice president; George A. Hughes secretary, and R. S. Price treasurer.

The Maibohn Motor Co., Racine, Wis., has entered into an agreement with the Chamber of Commerce, Sandusky, Ohio, to move to that city and build a plant 100 x 600 ft., employing at the offset 250 men. provided \$100,000 is raised for the company in that city. The company's plant, which has been manufacturing trucks and passenger cars, was burned recently.

H. C. Leesberg, factory manager of the Fostoria Screw Co., Fostoria, Ohio, will be at the head of a new company which will establish a plant in one of the buildings of the Fostoria Factories Co. for the manufacture of piston rings and other automobile parts.

Indianapolis

INDIANAPOLIS, March 24.

It is announced that the General Motors Co. has bought the Inter-State Automobile Co.'s factory at Muncie, Ind., with 43 acres adjoining, on which a large plant will be established.

The American Axle Mfg. Co., Greensburg, Ind., has been incorporated with \$30,000 capital stock to manufacture axles. The directors are W. S. Reed, Frank Hamilton and William Smiley.

The Gary Motor Truck Co., Gary, Ind., is making alterations and additions to its plant to increase the capacity from 40 to 150 trucks per day. It will manufacture a 5-ton truck in addition to five smaller sizes now made. Frank Dawson, formerly manager of the Master Motor Truck Co., Chicago, is general manager.

Of the \$4,250,000 to be spent by the Studebaker Corporation for extensions at South Bend, Ind., \$1,650,000 will be for buildings and railroad tracks and \$2,600,000 for machinery. The new buildings will furnish 480,000 sq. ft. of floor space.

The A. I. M. Mfg. Co., Richmond, Ind., has been incorporated with \$200,000 capital stock to manufacture spark plugs and other devices. The directors are Samuel M. Kitchen, John M. Lentz and George E. Seidel.

The Betz Motor Truck Co., Hammond, Ind., has been incorporated with \$25,000 capital stock to manufacture automobile trucks. The directors are Frank S., Irving K., T. Herman, and Lyman B. Betz.

The W. N. Johnson Automobile Sheet Metal Works, Richmond, Ind., has been incorporated with \$150,000 capital stock, to manufacture sheet metal parts. The directors are William N., M. J., and A. J. Johnson and Edward F. Hollarn.

The Fulton Tractor Co. has leased the Imbler wire fence factory at Alexandria, Ind., and will manufacture tractors, the invention of James F. Fulton.

A contract has been let by the East Chicago and Indiana Harbor Water Co., East Chicago, Ind., to the Warner Construction Co., Chicago, for a filtration plant to cost \$333,000. One new boiler and two new pumps will be required.

The Marion Foundry Corporation, Marion, Ind., has been organized and will build a plant to manufacture foundry products, with a newly-patented grate as specialty. The company has \$30,000 capital stock. Ora E. Butz is president; George L. Cole, vice-president; K. E. Morris, secretary and L. Leroy Close, treasurer.

The Van Briggles Motor Device Co., Indianapolis, Ind., is arranging for a site for the construction of a new plant, to be operated in conjunction with the present works. The company recently increased its capital from \$300,000 to \$500,000. H. S. Rominger is treasurer.

The Dudley Phonograph Co., Elkhart, Ind., has been incorporated with a capital of \$200,000 by Samuel W. Dudley, Roy T. Newland and Francis N. Harris to manufacture talking machines.

The Master Trucks of Indiana, Lafayette, has been incorporated with a capital of \$20,000 by Burt J. Kaull and Louis F. Bowser to manufacture trucks and parts.

The Indiana Power & Water Co., Edwardsport, Ind., has been granted permission by the Public Service Commission to issue \$160,000 in preferred stock and \$340,000 in bonds, for plant extensions and betterments.

The Faultless Caster Co., Springtown Road, Evansville, Ind., is taking bids for the erection of a one-story addition, 47 x 57 ft., to be equipped as a plating department. B. F. Nolting is manager.

The Empire Electric & Machine Co., Terre Haute, Ind., has been incorporated with a capital of \$25,000 by Herbert Coffmann, Charles F. Behringer and C. A. Epling to manufacture electrical specialties.

Milwaukee

MILWAUKEE, March 24.

Machine tool manufacturers grow more hopeful as the general situation in metal-working industries clarifies and orders are placed with more freedom than at any time since the cessation of hostilities. While large lot requirements appear only occasionally, the purchases of single tools or small lots are more frequent, which is imparting a better tone to the market. The determination of prices on basic products is expected to result in the general dissipation of the waiting attitude and induce buyers to make commitments which have been held in abeyance because of unsettled conditions respecting values.

The milling machine business is fairly active, but largely confined to the automotive industries. Manufacturers continue to receive a stream of small orders from Detroit, Toledo, Cleveland, Indianapolis as well as from gas engine, automobile, truck and tractor manufacturers in Wisconsin and Illinois, where the tractor industry especially is undergoing the greatest expansion of its history.

The labor situation is relatively satisfactory, with a good demand for skilled machinists and foundry workers and hardly enough men available to fill all openings.

The Bayley Mfg. Co., 732 Greenbush Street, Milwaukee, has increased its capital stock from \$140,000 to \$250,000. The company manufactures fans and blower systems and is enlarging its output. It recently took over the controlling interest in the C. Colnik Mfg. Co., 750 Greenbush Street, manufacturer of structural and ornamental iron. These facilities will be diverted to the fan and blower production gradually. The Bayley company several months ago took under consideration tentative plans for the construction of a malleable and gray iron foundry and this project may be revived during the year, although at this time no definite action in this direction has been taken. Eugene Worthing is president.

The Milwaukee Tank Works, 851 Kinnickinnic Avenue, Milwaukee, is contemplating the erection of a new plant on a site in the town of Wauwatosa. The present works were considerably damaged by fire recently, and if the new plant project is undertaken, will be abandoned. The loss by fire is estimated at \$25,000. The estimated cost of the proposed new works is about \$35,000. Robert L. Bienstock is president.

The Anchor Ship Building Co., Washburn, Wis., has been reorganized following the purchase of the interest of Wildmar Nicolayson, Duluth, Minn., one of the founders of the company, by other stockholders. The new officers are: President and treasurer, George F. Morgan, Washburn; secretary, William Messenger, Washburn; directors, W. Gunn Smith, Superior; P. W. Trimborn, Milwaukee; G. B. Thompson and M. H. Sprague, Washburn. A vice-president will be elected later. Mr. Smith has been made general manager. Work on the construction of six ways, structural and machine shops and auxiliary buildings will be undertaken at once and the equipment is now being contracted for. It is hoped to lay the first keel by June 1. The yard will construct steel vessels exclusively and will specialize in 140-ft. steel trawlers and boats of 1000 to 2000 tons.

The W-H-Y Electric Equipment Co., 807 Grand Avenue, Milwaukee, has changed its corporate style to W. Frank Horn Co., Inc. The company manufactures industrial and automotive electrical equipment. W. Frank Horn is president and treasurer; Lafayette Yakes is secretary.

The Parker Pen Co., Janesville, Wis., is taking bids for the erection of a new three-story factory, office and power plant, designed by Frank A. Carpenter, architect, Rockford, Ill., and estimated to cost \$100,000. The Parker company manufactures fountain pens, clips, etc., and will more than treble its output. New machinery and equipment is being purchased. George S. Parker is president.

The Ideal Mfg. Co., Hartford, Wis., has been organized by August Rochwhite to manufacture tweezers and other small tools and hardware specialties. It has taken over the factory of the former Dental Burr Co., Hartford, which is 30 x 60 ft., and may be enlarged by the addition of a second story. Operations will begin April 1. Nearly all of the equipment has been provided.

The Corrugated Tank Machine Co., Milwaukee, has been incorporated with a capital stock of \$5,000 by Paul Steudel, F. Thill and H. F. Friedrich, attorney, 120 Wisconsin Street.

The Common Council, Two Rivers, Wis., has directed the Board of Education to proceed with the work of securing plans and specifications for an addition to the high school. Manual training and domestic science departments will be provided.

The Reliance Motor Truck Co., Appleton, Wis., which recently was reorganized, has issued its first truck, a 1½-ton model, marking the beginning of a regular production at the rate of one chassis a day. After July 1 a 2½-ton model will be produced and the capacity of the plant increased to two a day. In addition, a large output of motor truck axles of the external spur gear drive type will be provided for. H. F. Vahl, formerly production manager of the Stegeman Motor Car Co., Milwaukee, is works manager.

The Miller Broom Co., 111 South Front Street, LaCrosse, Wis., has plans for a one-story brick and concrete factory, 80 x 200 ft., for the manufacture of brooms, brushes, handles, etc. The investment will be about \$35,000, including machinery and equipment. Albert L. Miller is president and general manager.

The Portage Iron Works, Portage, Wis., will build an addition costing \$15,000 to be used as an auxiliary machine shop and as a public garage and repair shop.

The Hohmann-Nelson Co., Eau Claire, Wis., has been organized with a capital stock of \$100,000 by A. B. Hohmann and A. J. Nelson to manufacture thermometers, indicating, recording and controlling instruments for pressure, time and levels. The company has leased space in the plant of the Eau Claire Mfg. Co., but later intends to erect a factory. The officers are: President, A. B. Hohmann; vice-president and secretary, A. J. Nelson; treasurer, Edward Hutchens. Mr. Nelson is general manager.

The National Drop Head Projector Co., Fond du Lac, Wis., manufacturer of portable motion picture machines, has awarded the general contract for the construction of its machine shop and factory to the Rosenbaum Construction Co., local. It will be of brick and concrete, two stories, 48 x 100 ft., and cost about \$25,000, fully equipped.

The Bump Paper Fastener Co., LaCrosse, Wis., manufacturer of automatic paper fastening appliances and devices, office appliances, has awarded the general contract to Doten & Klick, 924 Vine Street, local, for the erection of a new machine shop and office building, 60 x 155 ft., one story high. The shop and equipment will cost about \$30,000.

St. Louis

ST. LOUIS, March 24.

The Nettleton Gin & Milling Co., Jonesboro, Ark., has been organized by A. J. Glenn, L. H. Frizell and Fred Shauver and is reported in the market for about \$20,000 worth of machinery.

The Morrilton Cotton Oil Co., Morrilton and Little Rock, Ark., has accepted plans by A. G. Reid, Chicago, for a plant and will install 12 presses and other equipment costing about \$200,000.

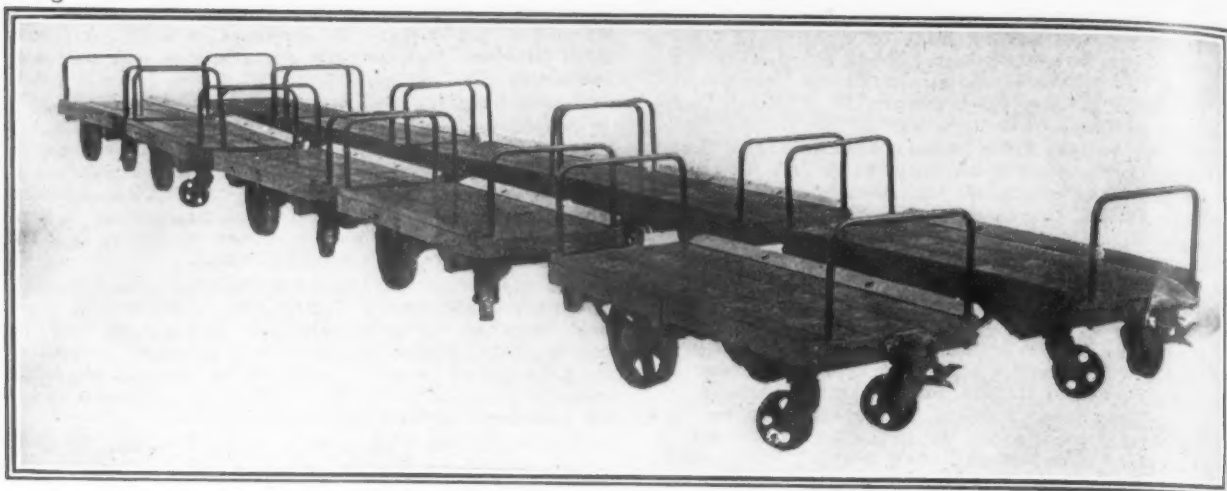
The Dalcour, La., drainage district, F. E. Fagot president, will install a pumping plant.

The city of Lexington, Miss., will equip an electric light and power plant. W. L. Jordan is city clerk.

The City Council, Senatobia, Miss., will issue \$15,000 in bonds for the purchase of electric light plant and waterworks machinery.

The city of Pawhuska, Okla., will issue \$250,000 in bonds for electric light and power plant equipment.

The Great American Refining Co., Tulsa, Okla., will equip



The Government recently purchased 4000 of these trailers, or 800 five trailer trains, from the Lansing Co., Lansing, Mich., for use in reserve depots and base warehouses. The Government's specifications stated that the rear trailer of each train must track with the front trailer, or when hauled by a tractor, within 6 in. on a right angle turn.

The 800 trains of five trailers each, if parked so as to be

accessible for tractors, would practically cover a six acre lot, or if coupled together, the trailers would extend seven miles.

The shipments of trailers made up 80 freight car loads and for the construction of the 4000 units were required 400,000 ft. of lumber, 300 tons of wheels and axles, 200 tons of casters complete, 90 tons of Carlton couplers and 16,000 Hyatt bearings.

oil tanking and pumping capacity on 125 acres. About \$2,000,000 will be spent.

The Arkansas Hydroelectric Development Co., Little Rock, Ark., has increased its capital \$450,000 for extension work and installation of equipment.

The Oklahoma Laundry Co., Enid, Okla., will equip a plant requiring about \$45,000 worth of machinery.

The Winona Creamery Co., Winona, Miss., is reported in the market for refrigerating equipment.

The Chickasha Peanut Oil & Products Co., Chickasha, Okla., D. C. Hybarger president, has been organized and will install pressing machinery, power plant, equipment, etc.

Yount & Galeener, Sikeston, Mo., will erect a garage and machine shop, 80 x 150 ft., and are in the market for equipment.

The North Mississippi Cotton Oil Co.'s plant at Holly Springs, Miss., has been destroyed with a loss of \$140,000 on machinery which is to be replaced.

The plant of the Churchill Cotton Compress Co., Vicksburg, Miss., has been destroyed by fire with a loss of \$75,000. It will be re-equipped.

W. C. Kinsello, 1104 Union Avenue, Kansas City, Mo., is reported in the market for machinery, including 1½ in. punching and shearing machines, double end 1-in. punching machines, countersinking, edge planing, horizontal punching and beam bending machines, joggling hydraulic plate flanging machines and similar equipment.

The Climber Motor Corporation, Little Rock, Ark., has arranged for the immediate construction of an addition to its plant, 100 x 300 ft., for the manufacture of automobile parts and assembling operations. It will cost about \$25,000. H. F. Buhler is manager.

The Adams Machinery & Mfg. Co., Mobile, Ala., is planning for the erection of a new three-story plant, 113 x 160 ft., estimated to cost about \$70,000, on property recently acquired. A machine shop will be equipped.

The Pacific Coast

SEATTLE, March 17.

The strikes and controversies that have tied up Seattle shipyards for seven weeks have apparently been satisfactorily adjusted, and the industry is entering upon a new era of activity. Every steel yard in the city is operating most of them to capacity. All the steel plants have contracts on hand to insure operation for many months, with prospects of further contracts when needed.

General business conditions are beginning to show improvement and there is a tendency to revive a number of pre-war industrial plans, but manufacturers are hesitating on new construction, and purchase of equipment, in hope of lower prices.

The Astoria Pulp & Paper Co., Astoria, Ore., is having plans completed for a two-story addition, 36 x 140 ft., to cost \$25,000.

The Cedar Mills, Ltd., Lynn Valley, near Vancouver, B. C., will double its capacity by installation of new equip-

ment and other improvements to cost \$25,000. When completed, the plant will have daily output of 120,000 shingles.

The Washington Excelsior Co., Seattle, will build a new shop, 40 x 80 ft., to be equipped with new machinery.

The Northwest Steel Co., Portland, has practically completed its new outfitting plant, which will be equipped for supplying all necessary materials to steel ships, with exception of boilers and heavier machinery.

The Prince Rupert Drydock & Engineering Co., Prince Rupert, B. C., has secured contract for two 8100 ton steel ships. Employment will be given to 600 men.

The Foundation Co., Victoria, B. C., is taking over the Ogden Point assembling plant for the outfitting of 20 vessels built in Victoria for the French Government. The existing plant was purchased from the Imperial Munitions Board for \$60,000 and the owners will equip a new plant equal in size.

The auxiliary power plant of the Federal Mining & Smelting Co., Burke, Idaho, was burned recently, entailing a loss of \$20,000.

The planing mill of the White Pine Lumber Co., Union, Ore., was destroyed by fire recently, with a total loss of \$10,000.

The Kroyer Mfg. Co., Stockton, Cal., will build a plant in that city to manufacture the Kroyer Wizard 4-Pull tractor. A \$5,000,000 corporation has been organized to finance the company.

The Skandia-Pacific Oil Engine Co., Oakland, has applied for a 20-year lease on a plot of 150 x 260 ft., adjoining its factory, where it is to erect an extension to its foundry, to cost \$50,000.

The Egyptian Cotton Association, Imperial Valley, Cal., will build a plant at San Diego for compressing cotton grown in Imperial Valley. The total cost will be \$85,000 and it is expected that the first unit will be completed within 30 days.

The Ventura Mfg. & Implement Co., Ventura, Cal., has purchased the property of the Ventura Mill & Lumber Co. and will erect new buildings. It is expected that 1000 men will be employed in the factory when in full operation.

The King City Machine & Electric Shop, King City, Cal., has been organized by C. T. Michalic and Joseph Newerkla, both formerly of San Francisco.

The Noble Electric Steel Co.'s smelter at Heroult, Cal., has been closed in connection with the readjustment of the financial affairs of the company. The Iron Mountain mine, operated in connection with it, has also been closed.

Texas

AUSTIN, March 22.

The Texas Producing & Refining Co., Fort Worth, which was recently incorporated with a capital of \$2,000,000, has adopted plans for the construction of two oil refineries. One plant of 2000 bbl. daily capacity will be located at Henrietta, and the other with a daily capacity of 4000 bbl. will be at Fort Worth.

Roland & Phillips, Fort Worth, plan to build an oil refinery at Henrietta with a daily capacity of 2000 bbl.

is E. Robinson of Fort Worth is promoting the construction of an interurban electric railroad between that city and Mineral Wells, about 65 miles. An electric power plant is involved in the project.

The Southland Gin Co., Southland, will build a cotton gin to cost \$15,000.

W. C. Streety and associates will build a 3000 bbl. oil refinery at DeLeon to cost about \$600,000.

Canada

TORONTO, March 24.

Industrial conditions are gradually becoming more settled, but much has yet to be done before general activity will be resumed. Machinery dealers report business as improving. The best of the shell shop material has been pretty well sorted over, and when this has been completed the sale of new machinery will again become more active. A large part of this equipment has been sold as scrap, as the bulk is special machinery and of little use for general manufacturing purposes. A large number of garages are taking over the best of the machinery, provided it is of general purpose type and suitable for repair work. Railroad shops are again coming into the market for more equipment. Manufacturers who have announced that they are prepared to go into the market for machinery have not stated what they are buying, in fact, they are not quite certain and in a number of cases will buy as they find their requirements calling for certain production. Warehouses, which were up to a few months ago, well stocked with machinery, now find themselves almost cleaned out. Manufacturers who formerly carried large stocks on hand, have, to a large extent, let their supplies run out, and do not intend to stock up very largely until they have a better idea as to future conditions of the market. There is little anxiety on the part of manufacturers, as the home market, together with the present prospects for business abroad is increasing every day, and many new manufacturing concerns are coming into the country. In addition, plants which were turning out war material in the past four years are now preparing to manufacture entirely new lines. In fact it is the intention of companies turning out steel products, to make practically every article that can be used in the manufacturing or agricultural industries of Canada.

The Canadian Collapsible Rim Co., Windsor, Ont., has been incorporated with a capital stock of \$500,000 by J. H. Campbell, Ouelette Avenue, Windsor; Sidney Anderson, manager of the Sandwich, Windsor & Amherstburg Railway; James B. Gunn, Winnipeg, Man., and others. It is the intention to commence at once on the erection of manufacturing plant. Frederick Kerby, Windsor, is attorney.

The Auto Specialties Co., St. Joseph, Mich., is making arrangements for the erection of a plant on Howard Avenue, Windsor, and is asking the Finance Committee to put it by-law form an exemption ruling for \$50,000 for 10 years.

The H. H. Robertson Co. of Canada, with a capital stock of \$200,000 has purchased the plant of the Sarnia Metal Products Co., Sarnia, Ont., and plans to commence operations about May 1 on the manufacture of asbestos covered steel roofing and siding, ventilators, gutters, pipes, skylights, etc. The officers are: President, H. H. Robertson, Edinburgh, Pa.; vice-president, James Playfair; secretary, R. I. Towers; treasurer, S. Gurd; managing director, C. Mackenzie, formerly with the firm of Mackenzie, Milne & Co. Ltd., Sarnia.

The City Council, Saskatoon, Sask., plans the construction of an addition to its waterworks plant and is in the market for turbines, machinery, and other equipment. Andrew Leslie is clerk.

The Victoria Machinery Depot, 343 Bay Street, Victoria, B. C., has let the general contract for shipyards and a machine shop costing \$350,000. Tenders are wanted for engines and boilers within 60 days.

The Town Council, Viking, Alta., plans an electric lighting system and is interested in prices of plant and equipment. W. McAthey is clerk.

William Kennedy & Sons, Ltd., Owen Sound, Ont., are in the market for one 15-ton electric traveling crane, 39 ft. 10 in. span, 3 motor, 60 cycle, 550 volt.

A. W. Adams, 55 West Lodge Avenue, Toronto, is in the market for a 500-hp. engine.

The Alabastine Co., Ltd., Paris, Ont., is in the market for a medium or large size jaw or apron style stone crusher, also medium size gyratory crusher.

The British Whig Publishing Co., Kingston, Ont., is in the market for a 28 hp., 550 volt, three phase, 60 cycle variable speed motor and controller. Will consider second hand, if guaranteed.

J. E. Russell, Harbor Administration Building, Toronto,

is in the market for a 6 x 8 N. F. 1, Ingersoll-Rand air compressor.

Fred Dettman, Kinmount, Ont., is in the market for an 80 hp. engine.

Excavation has been started on a refrigerator plant and office building for Gunns, Ltd., Gunns Road, Toronto, to cost \$500,000. General contractors are the Carswell Contracting Co., 58 Wellington Street East; Henschell & MacLaren, Chicago, Ill., are the architects.

The Doherty Metal Plating Co., Ltd., Sarnia, Ont., has been incorporated with a capital stock of \$200,000 by John Doherty, William Logie and Robert I. Towers, Sarnia; Lincoln Avery, Port Huron, Mich., and others to manufacture metal plates, etc.

The Canadian File & Tool Works, Ltd., Montreal, has been incorporated with a capital stock of \$200,000 by Frederick T. Enright, Westmount, Que.; Thomas B. Gould, Lachine, Que.; Egbert W. Westover and others of Montreal, to manufacture machinery, tools, implements, etc.

The Eastern Canada Motor Truck Co., Ltd., Ottawa, Ont., has been incorporated with a capital stock of \$500,000 by Percy D. Wilson, Gaston Fontaine, George A. Welch and others to manufacture motor cars, trucks, engines, machinery, etc.

The Crammond Machinery Co., Ltd., Montreal, has been incorporated with a capital stock of \$50,000 by Walter S. Johnson, Alexander R. Hall, Rhoda M. Husband and others to manufacture machinery, automobile parts, engines, etc.

The Thompson Welding Co., Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by John A. Kent, 44 King Street West; Maxwell C. Purvis, Canada Life Building; Geoffrey S. O'Brien and others to manufacture machinery, tools, etc.

Arthur Balfour & Co., Ltd., Toronto, with a capital stock of \$40,000, has been granted permission to manufacture machinery, tools, etc., in Ontario, and has appointed John L. Milner, 36 Colborne Street, Toronto, attorney.

The Montreal Pattern Works, has opened offices and a factory at 242 Clarke Street, Montreal, and is prepared to manufacture patterns of any description. George Underwood is managing director.

The Beaver Engineering Co., Montreal, is offering for sale its entire plant and equipment.

The Northwestern Iron Works, 1419 Scarth Road, Sask., is in the market for one 2 hp. motor, three-phase, 60 cycle, 220-volts; one 10-in. lathe chuck, 4 jaw; one 16, 18 or 20-in. lathe chuck, 4 jaw.

The Canadian Renulife Electric Co., Ltd., Windsor, Ont., has been incorporated with a capital stock of \$40,000 by Richard J. Sherman and James H. Eastman, Detroit, Mich.; William M. Thompson, Ford City, Ont.; Edward W. M. Flock, London, Ont., and others to manufacture electrical generators, transformers, machinery, etc.

The Ferro Alloys Iron & Coke Co., Ltd., Toronto, has been incorporated with a capital stock of \$100,000 by Henry H. Davis, 10 Adelaide Street East; Edward H. Brower, 160 Huron Street; Lawrence A. Landrian, to manufacture machinery, mechanical appliances, etc.

Bowlby & Gluns, Ltd., Windsor, Ont., has been incorporated with a capital stock of \$40,000 by Andrew D. Bowlby, Windsor; Richard H. Gluns, Sandwich, Ont., and others to manufacture automobiles, machinery, engines, etc.

The Thermos Heating Systems, Ltd., Toronto, has been incorporated with a capital stock of \$1,000,000 by Frank Regan, 72 Queen Street West; John Callahan, Edward Murphy and others, to manufacture boilers, stoves, heating apparatus, etc.

The Stewart Phonographic Corporation, Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by Mervil MacDonald, Bank of Hamilton Building; Gideon Grant, 48 Nanton Avenue; Edwin Smily and others, to manufacture phonographs, musical instruments, motors, accessories, etc.

The International Engineering Corporation, Ltd., Toronto, has been incorporated with a capital stock of \$750,000 by Melvin G. Hunt, 17 Queen Street East; Albert E. Shaw, David McLaren and others, to manufacture steam and internal combustion engines, pumps, machinery, etc.

The Canadian Drill & Electric Box Co., Ltd., Toronto, has been incorporated with a capital stock of \$100,000 by Frank J. Hughes, Room 307, 72 Queen Street West; Leo J. Phelan, 12 Seaforth Avenue; Henry Catley and others, to manufacture machinery, electrical supplies, etc.

The Macarthy Milking Machine Co., Ltd., Ottawa, Ont., has been incorporated with a capital stock of \$100,000 by Thomas Delahaye, Brockville, Ont.; Thomas Brownlee, Daniel Herron and others, to manufacture cream separators, milking machines, farm implements, etc.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

Iron and Soft Steel Bars and Shapes

Per lb.

Bars:

Refined iron, base price	4.17c
Burden's H. B. & S. bar iron, base price	6.30c
Burden's best bar iron, base price	6.50c
Swedish bars, base price	20.00c

Soft Steel:

¾ to 1½ in., round and square	3.37c
1 to 6 in. x ¾ to 1 in.	3.37c
1 to 6 in. x ¼ and 5/16	3.47c

Rods—¾ and 11/16

Bands—1½ to 6 x 3/16 to No. 8	4.07c
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Shapes:

Beams and channels—3 to 15 in.	3.47c
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Angles:

3 in. x ¼ in. and larger	3.47c
3 in. x 3/16 and ½ in.	3.72c
1½ to 2½ in. x ½ in.	3.72c
1½ x 2¾ in. x 3/16 in. and thicker	3.47c
1 to 1¼ in. x 3/16 in.	3.52c
1 to 1¼ in. x ½ in.	3.57c
¾ x ¾ in. x ¾ in.	3.62c
¾ x ¾ in.	3.67c
¾ x ¾ in.	4.47c
½ x 3/32 in.	5.17c

Tees:

1 x ½ in.	3.87c
1¼ in. x 1¼ x 3/16 in.	3.77c
1½ to 2½ x ¼ in.	3.57c
1½ to 2½ x 3/16 in.	3.57c
3 in. and larger	3.52c

Merchant Steel

Per lb.

Soft steel bars	3.37c
Tire, 1½ x ½ in. and larger	3.37c
Toe calk, ½ x ¾ in. and larger	4.72c
Open-hearth spring steel	7.00c
Standard cast steel, base price	15.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

Per lb.

¼ in. and heavier	3.67c
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Sheets

Blue Annealed

Per lb.

No. 8 and 3/16 in.	4.52c
No. 10	4.55c to 4.57c
No. 12	4.60c to 4.62c
No. 14	4.65c to 4.67c
No. 16	4.75c to 4.77c

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	5.30c to 5.50c	—
Nos. 22 and 24	5.35c to 5.55c	7.62c
No. 26	5.40c to 5.60c	7.67c
No. 28	5.50c to 5.70c	7.82c
No. 30	5.70c to 5.90c	—
No. 28, 36 in. wide, 10c. higher	—	—
Genuine Russia, as per assortment	22½ @ 25c	—
Woods Keystone Hammered,	—	—
18-24 gage, 10c.; 26-28 gage, 11c.	—	—

Galvanized

Per lb.

No. 14	5.60c to 5.80c
No. 16	5.75c to 5.95c
Nos. 18 and 20	5.90c to 6.15c
Nos. 22 and 24	6.05c to 6.25c
No. 26	6.20c to 6.40c
No. 27	6.35c to 6.55c
No. 28	6.50c to 6.70c
No. 30	7.00c to 7.20c
No. 28, 36 in. wide, 20c. higher	—

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

On a number of articles the base price only is given it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER

Bright basic	5.50c
Annealed soft	5.50c
Galvanized annealed	6.25c
Coppered basic	6.25c
Tinned soft bessemer	7.50c

*Regular extras for lighter gages.

Brass Tubes, Rods and Wire, and Copper Tubes

Manufacturers have withdrawn all quotations because of unsettled prices of raw materials and will only name prices to actual buyers.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 22½c. to 24½c. per lb.	—
Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.	—
Polished, 20 in. wide and under, 1c. per sq. ft. extra over 20 in. wide, 2c. per sq. ft. extra.	—
Planished copper, 1c. per sq. ft. more than polished.	—
Tinning, one side, 6c. per sq. ft.	—

Tin Plates

Bright Tin	Grade	Grade	Coke—14x20	Primes	Western
	"AAA"	"A"			
Charcoal	Charcoal	Charcoal	80 lb.	\$8.70	\$8.45
14x20	14x20	14x20	90 lb.	8.80	8.55
			100 lb.	8.90	8.65
IC	\$11.65	\$10.40	IC	9.15	8.90
IX	13.85	12.35	IX	10.30	10.05
IXX	15.60	14.10	IXX	11.45	11.20
IXXX	17.35	15.85	IXXX	12.60	12.35
IXXXX	19.10	17.60	IXXXX	13.75	13.50

Terne Plates

8-Lb. Coating 14x20

100 lb.	\$8.90
IC	9.00
IX	10.00

Tin

Straits pig	74c to 75c
Bar	85c to 90c
American pig, 99 per cent.	70c to 72c

Copper

Lake Ingot	16½c to 18c
Electrolytic	16½c to 18c
Casting	16½c to 18c

Spelter and Sheet Zinc

Western spelter	9c to 10c
Sheet zinc, No. 9 base, casks	12c; open 12c

Lead and Solder*

American pig lead	6½ to 7c
Bar lead	7½c to 8½c
Solder ½ & ½ guaranteed	45c
No. 1 solder	40c
Refined solder	34c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c
Commercial grade, per lb.	50c

Antimony

Asiatic	10c to 11c
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting (carload lots), f.o.b. mill, per lb.	33.10c
In small lots	38c to 40c

Old Metals

There is no change in the general situation. Business is very quiet. Dealers' buying prices are nominally as follows:

Copper, heavy and crucible	13.00c
Copper, heavy and wire	12.00c
Copper, light and bottoms	10.00c
Brass, heavy	7.50c
Brass, light	6.00c
Heavy machine composition	12.00c
No. 1 yellow rod brass turnings	7.00c
No. 1 red brass or composition turnings	10.00c
Lead, heavy	4.50c
Lead, tea	3.50c
Zinc	4.50c

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50e
50e
25e
25e
50e

*
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lb.
hot

over

stem

8.45
8.55
8.65
8.90
0.05
1.20
2.35
13.50

\$8.50
9.00
10.00

75e
90e
72e

18e
18e
18e

10e
13e

to 7e
8 1/4e
..45e
..40e
..34e

ccord-

..90e
..50e

to 11e

33.10e
to 40e

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